THE DEVELOPMENT OF NATIONAL POLICY WITH RESPECT TO WATER RESOURCES

BY

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PREFACE

This study attempts to make a broad survey of national policy with respect to water resources, from the beginning of policy in 1824 for the improvement of the Ohio and Mississippi Rivers for purposes of navigation to the present. In 1882 the first appropriations were made for flood protection of the lower Mississippi Valley; in 1902 the Federal Reclamation Act was passed providing for the development of irrigation projects with Federal funds. In 1920 the Federal Water Power Act was passed, which provided not only for the licensing and regulation of the use of water power sites on navigable waterways and the public domain, but also indicated that power licenses should be granted with a view to achievement of the comprehensive development of a river system -- to realize the maximum potential power and coordinate power production with other uses of water. Since that time, the trend of national policy has been definitely in the direction of coordinated planning for each drainage basin. The following study, therefore, is an analysis of this development of policy -- of the various forces and interests which have been influential in directing policy, and the problems which are involved in the realization of the complete use of water resources. Throughout the study the viewpoint is that of public welfare -- of the interest of society in conserving its water resources in a perpetual state of usefulness and to utilize them to their fullest capacity.

The primary source of material for the study have been publications of the Federal Government, including hearings and bills, documents, reports and debates of both the House and the Senate, and

the annual and special reports of the administrative departments and independent agencies. Of particular importance to this study have been the so-called "308 Reports", which are comprehensive surveys of all the important river systems in the country for the coordination of navigation, water power, irrigation and flood control. These surveys were made by the United States Army Engineers. Attention is also directed to the reports of the National Resources Board, the Mississippi Valley Committee, the Pacific Northwest Regional Planning Commission, the Committee on Water Flow, the Great Plains Committee, the Tennessee Valley Authority, and the special studies which have recently been made by the Federal Power Commission, as of particular value. Inasmuch as the study is confined to national policy, the activities of the States have been considered only insofar as there was a direct connection between the two. This is true in the case of the Central Valley and St. Lawrence projects. The reports of the California State Department of Public Works on water resources, the Power Authority of the State of New York, and the St. Lawrence Power Development Commission have been the principal state publications used.

Wherever adequate secondary material has been available, such as Jerome G. Kerwin, National Water Power Legislation, and the studies of the Institute for Government Research, that aspect of the subject has been treated in a summary manner. For the most part, there is very little secondary material dealing directly with the subject of national policy, although there are many books and articles which consider certain aspects of the problems connected with the utilization of water and land resources which have been very helpful in this study.

I wish to express my indebtedness to Prof. H. M. Gray, who has read the entire manuscript and offered many valuable suggestions in the preparation of the thesis.

May 13, 1937. Leahmae Brown

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INTRODUCTION

During the past few years there has been a considerable increase of interest in the problem of conservation and efficient utilization of water resources. The growth of population, the drainage of marches and swamps, the cultivation of overflow land, the concentration of industries, dust storms, the drought, and the lowering of the water table, have increased the importance of water to the economic and social welfare of the Nation, and have directed attention to the need for a national water policy. This interest has been stimulated by the activities of the Tennessee Valley Authority and the adoption of public works projects for the development of water power, flood control, navigation, irrigation and other aspects of water control and utilization. The studies of the Public Works committee for the complete development of the Mississippi Valley, of the National Resources Board for comprehensive planning of water and land utilization, of the State planning organizations, and of the Army Engineers for coordination of the uses of water, have all served to arouse public concern in the problem. The evidence of this interest is found in the number of bills recently introduced in Congress for more complete and coordinated development of important rivers in the United States, such as the Mississippi and its main tributaries, the Potomac and the Connecticut.

In 1934 the Norris-Wilson resolution was passed, requesting the President to submit a comprehensive plan for the improvement and development of the rivers of the United States as a guide to legislation providing for the maximum amount of flood control, navigation,

irrigation and the development of water power. The report which was submitted by the President's interdepartmental committee revealed that the subject of the proper development of water resources was of much broader scope than indicated in the request of Congress, and that further study of all aspects of the subject would be necessary. As stated by President Roosevelt:

> ". . . the resolution of the Congress, covering the subjects of flood control, navigation, irrigation, and development of hydroelectric power, automatically opened the door to all interrelated subjects which come under the general head of land and water use. This broader definition brings to our attention very clearly such kindred problems as soil erosion, stream pollution, fire prevention, reforestation, afforestation, marginal lands, stranded communities, distribution of industries, education, highway building, home building, and a dozen others."[1]

No further action has been taken by Congress to formulate a comprehensive policy with respect to water resources, but it is anticipated that some type of legislation may be forthcoming during the present administration.

The importance of water resources to national economic development and the general social welfare is so obvious that it needs but little elaboration. Water of a high degree of purity is necessary for domestic purposes and in many manufacturing processes; it is used for the irrigation of crops and the generation of power. Waterways and lakes offer means of transportation, and disposal of sewage and industrial wastes. They also offer recreational facilities and are essential to the existence of fish and wildlife. On the other hand, water may be very destructive to life and property, which necessitates expensive means of control. Considering the variety of uses of water resources, it is apparent that many conflicts may arise be-

1. Development of Rivers of the United States, H. Doc. 395, 73rd Cong., 2d sess.

tween individuals, cities and different sections of the drainage basin as to the most beneficial utilization of the river system.

The availability and use of water resources is not only an important aspect of regional economic development and social welfare, but also introduces problems which are national in scope. The improvement of rivers for navigation, the development of power, and the availability of large quantities of pure water have been important factors in determining the location of industry and the distribution of population. The use of water for irrigation has not only developed those particular sections of the country but has had an effect on agricultural development in other sections of the country. From the national point of view, irrigation and drainage of fertile soils may be a partial solution to the problem of submarginal farming. The pollution of a stream by sewage and industrial wastes may have disastrous effects on industries and public health far downstream from the original source of pollution. A flood not only destroys property by inundation, but it also interrupts interstate commerce and disturbs the balance of our highly specialized, integrated economic system.

The present interest in water resources arises from this ever-increasing importance of water in the economic and social system, the many conflicts which have arisen from the uncoordinated and unplanned use of water, and the waste and misuse of water and land resources in the free private enterprise system. Recent studies of the subject by the States and the Federal Government, therefore, have stressed the need for a water policy for the full use, development, and enjoyment of water resources of the United States; and for the development of a complete river system in accordance with a definite plan, which will consider all elements of the problem of

water and land utilization within the drainage basin and coordinate the regional plan with national aspects of the program.

The purpose of this study is to analyze the development of national policy with respect to water resources, the extent to which the Government has assumed responsibility for the control and development of water resources, the rise of interest in various aspects of the subject and the reasons for the increase of interest, to determine the factors which have directed the course of national policy and the extent to which the various uses of water have been coordinated. Underlying all governmental activities is the tacit assumption that the purpose of such action is to promote the public welfare. National interest is the fundamental purpose; policy is the concrete expression of the means of obtaining that end. As stated by Charles A. Beard:

> "Although none of the thinkers and statesmen who thus present the doctrine of national interest speak in the language of exact science, they apparently conceive interest as a reality open to human understanding and as a kind of iron necessity which binds government and governed alike. It binds them so closely that there is no escape, except possibly for an insignificant minority; it cuts across the social divisions reflected in political parties and compels a 'united front' -- an integrated, totalitarian State."[2]

One of the most important aspects of this study of national policy, therefore, is the determination of the concept of national interest upon which it is based. The idea of national interest, however, must rest on certain basic assumptions as to the proper relation of the government to business enterprise, the role of the government in the direction and control of the economic system, the rights of the individual, the privileges and responsibilities of private property, and many others. The determination of the concept

2. Beard, Charles A., The Idea of National Interest, p. 3.

of national interest which underlies Federal policy necessitates, therefore, the determination of these fundamental ideas, or institutions, which are inextricably bound up in the conception.

Wherever Federal action has important economic and political significance, there will be many special interests, either as adherents or opponents to such action, which will identify their particular cause with the public welfare. These special interests will range from a single business enterprise to an entire industry, and from a small political unit to a large section of the country comprising many States. The reasons for the interest of these special groups are in general either economic or political, such as the fear of individual financial loss or the hope of profit, the expectation of a general increase of wealth in a particular section of the country, or the apprehensive that Federal activity will encroach upon the political power of the State. The second aspect of this study, consequently, is the ascertainment of the role played by special interests in delaying, directing or diverting national policy. The third factor to which particular attention is directed is the scope of Federal policy with respect to water resources, the manner in which conflicting uses of water have been handled, and the extent to which these uses have been coordinated.

It is obvious from the purpose of the study that political and legal, as well as economic, factors must be taken into consideration, insofar as they have been instrumental in the development of national policy. In some instances, the political and economic elements are so closely interrelated that they cannot be distinguished. The legal aspects of national water policy are very important inasmuch as the authority of the Federal government over water resources extends

only to the maintenance and protection of rivers for the purposes of navigation. All other aspects of water utilization and diversion of water are under the sovereign power of the States. The line of demarcation between Federal and State power is very indefinite, however, and Federal authority over water resources has been extended beyond the direct protection or improvement of rivers for navigation. The uncertainty of the rights of Congress, however, and the necessity for the indirect approach to the problem of conservation and utilization of waterways presents complications in the formulation of national policy. Furthermore, the legal aspects of Federal activity are often used as a camoflauge by special economic and political interests to delay or prevent Federal legislation. The source of arguments as to the legality of proposed action, therefore, warrant careful consideration.

The subject of Federal policy with respect to water resources falls into two main divisions. The first deals with the separate uses or problems, including navigation, irrigation, flood control and hydroelectric power. The second is concerned with the multiple purpose projects which have been initiated by the Government or are now under consideration, including the Boulder Canyon Project, the Tennessee Valley Authority, the Columbia Basin Irrigation Project and the Great Lakes-St. Lawrence Seaway. The first four chapters of the study are accordingly devoted to the analysis of Federal policy with respect to the above mentioned separate aspects of water utilization. In Chapter V, the basic criteria of national policy is summarized and consideration is given to other aspects of water utilization and conservation which must be included in a complete regional and national plan of development, such as the supply of water for domes-

tic and manufacturing purposes, the regulation and conservation of surface and ground water, the limitation of stream pollution, the use of water for recreational facilities and for the maintenance of fish and wildlife, and the related problems of land use, agricultural policy and the distribution of industry. In the last three chapters of the study the multiple-purpose projects will be considered.

The present interest in the formulation of a national policy which will provide for the coordination of all aspects of water utilization presents many difficulties, such as (a) the extent to which all aspects of water and land utilization shall be included in the plan of development for a drainage basin; (b) the determination of the proper administrative agency and the division of responsibility; (c) the division of costs between Federal, State and local governments, and the private interests which may receive particular benefits; and (d) the solution of the legal problems, as to the extent of the authority of the Federal government, the powers of the States, and the rights of private individuals and landowners. In the consideration of the Federal multiple-purpose projects in the last three chapters of the study, attention will be given to the manner in which these problems have been handled (or are proposed to be handled), in addition to an analysis of the forces which have directed the national government to undertake these projects. In conclusion, an attempt will be made to anticipate the future development of policy and to indicate the outstanding difficulties which will be encountered in the formulation and administration of such a national program.

CHAPTER I.

NATIONAL POLICY WITH RESPECT TO THE IMPROVEMENT OF NAVIGABLE RIVERS

The beginning of national policy with respect to the improvement of rivers for navigation dates from the formation of the Union and the delegation of power to Congress to regulate interstate commerce. During the Colonial period, complete sovereignty over the use of water resources rested with the colonial governments. Following the acceptance of the Constitution, this control was divided between the States and the Federal Government, whereby the power of the States to direct the use and diversion of water was subordinated to the paramount authority of Congress to maintain navigable channels for interstate commerce.

Prior to the Civil War, the use of waterways as highways of transportation was an important aspect of national economic development. In many parts of the country, water offered the only means of transportation. Competition between the States and different sections of the country for rapid agricultural and industrial development led to large undertakings by the States and individual enterprise for the improvement of rivers and construction of canals to connect interior rivers with the Great Lakes and the Ocean. Congress was beseiged with demands for the improvement of waterway facilities. There was considerable uncertainty, however, as to the proper policy for the Federal Government to pursue, and the constitutionality of Federal expenditures for public works was frequently debated during the early part of the nineteenth century. The question was further complicated by the fact that the Democratic party was almost continuously in power after 1830, and it could not with any consistency support a

program of extensive internal improvements by the Federal Government in the face of their strong advocacy of States' rights.

National enthusiasm is reflected in an act passed in 1824 by Congress directing the President to make surveys and estimates for all roads and canals which "he may deem of national importance, in a commercial or military point of view, or necessary for the transportation of the public mail."[1] These surveys were not made, however, and Federal assistance in canal construction was confined to land grants to the States[2] and stock subscriptions in private canal companies.[3] Land grants were also made to the States in the enabling acts and by special legislation for the improvement of natural waterways.[4] The activities of the States and private transportation companies were confined, however, to particular localities and short sections of a river where sufficient commerce was available to pay the cost of such improvements. These agencies could not handle the problems of improving interstate waterways with the expectation that sufficient commerce would eventually develop to cover the costs. Accordingly, the Federal Government was regarded by the States and private interests of the Middle West as the proper agency to assume responsibility for the maintenance of a navigable channel in the Ohio and Mississippi Rivers. Inasmuch as these rivers were the principal commercial outlets of the entire region west of the Alleghanies, the maintenance of adequate water transportation facilities was recognized by Congress as a national problem justifying the expenditure

1. 4 Stat. 22.
2. 4 Stat. 234; 4 Stat. 236; 4 Stat. 716; 10 Stat. 35.
3. 4 Stat. 124; 4 Stat. 163; 4 Stat. 169.
4. 3 Stat. 489; 11 Stat. 166; 11 Stat. 383; 12 Stat. 126; 18 Stat. 474; 5 Stat. 453; 4 Stat. 290; 12 Stat. 250.

of Federal funds.[5] The Mississippi River Act which was passed in 1824 is generally considered to mark the beginning of national policy for the improvement of rivers.[6]

The expenditure of funds for the Mississippi and Ohio led to demands from all parts of the country for the improvement of other rivers; and by the exertion of political pressure, the list of Federal projects was gradually expanded. During the period 1826 to 1839 there was an annual rivers and harbors act. Each year the total appropriation was increased and, by 1839, all of the important rivers east of the Rocky Mountains were receiving some consideration. Throughout this period, the expansion of the policy was viewed with increasing alarm and the act of 1839 was subjected to severe criticism. The failure of many private and State canal undertakings, the depression of 1837, and the general opposition to Federal expenditures for internal improvements resulted in the discontinuance of the annual rivers and harbors acts and the decline of Federal activity in the improvement of rivers. Funds were provided sporadically for this purpose but the aggregate appropriation was small. At the insistence of local interests, an omnibus act was passed in 1852 which adopted a number of new projects, such as the Illinois and Colorado Rivers, in addition to allotments for all the projects which had previously been authorized. In 1856 all such Federal expenditures were discountenanced by the White House and all bills presented in that year were vetoed. Although several bills were passed over the

5. See report of the House Committee on Roads and Canals, No. 75, 18th Cong., 1st sess.; and the debate in Congress on the bill.
6. 4 Stat. 32.

veto,[7] no omnibus bill was enacted and the friends of river improvement were greatly discouraged.

Thus the practice of improving rivers with Federal funds, which had appeared to be well on its way to definite establishment in the thirties declined rapidly after 1840. Local and private interests attempted to revive the policy, and did so in 1852, but this victory was shortlived. The primary reason for this decline in interest in waterways was the rapid spread of the railway system. All attention was turned to this new method of transportation. Funds were contributed by the States and public land by the Federal Government. Canals were sold to the railroads for roadbeds, a practice which was later regretted,[8] and the railroads were permitted to establish rates which would drive out the competing waterways. Such was the picture of water transportation and Federal policy for the improvement of waterways in 1860.

Following the Civil War there was an immediate revival of interest in water transportation. The act of 1866 authorized a resurvey and examination of works of improvement for which appropria-

7. The most important of which were appropriations for removing obstructions in the mouth of the Mississippi River ($350,000), 11 Stat. 24; deepening the channel in the St. Mary's River ($100,000), 11 Stat. 25; continuing improvement of the Des Moines rapids in the Mississippi ($200,000), 11 Stat. 25; and deepening the channel of the Patapsco River ($100,000), 11 Stat. 44.

8. For example, the Pennsylvania Railroad Company purchased all the State owned canals in Pennsylvania in 1857. Its main line from Philadelphia to Pittsburg was built on the old Pennsylvania Canal. This canal system had cost the State $40,000,000, for which the railroad paid approximately $11,000,000. In 1920 the deputy secretary of the internal affairs of the State of Pennsylvania stated to the House Committee on Rivers and Harbors, "I think that our citizens today recognize the fact that it was a great economic mistake to permit the canals to be destroyed, because many of them today, if the routes were in existence, could undoubtedly be improved to a point that would greatly relieve transportation and add to the transportation facilities of the State." (Hearings on the Schuykill Canal, 66th Cong., p. 5.)

tions had previously been made.[9] These reports were to show the amounts and dates of all former appropriations for each work and a full estimate for its entire and permanent completion. Furthermore, the reports were to include the amount of revenue collected at the nearest port of entry for the preceding year and, "as far as practicable, the amount of commerce and navigation which would be benefited by the completion of each particular work." This is the first indication of Congress that expenditures for improvement should bear some definite relation to the amount of commerce.

From 1866 to 1882, with the exception of the year 1877, there was an annual rivers and harbors act. Each year the total appropriations and authorizations were increased, as was also the number of adopted projects. Many of these projects had been partially undertaken by private and local interests. After 1866, with a few exceptions,[10] the Federal Government abandoned the policy of encouraging local or private interests to make improvements, and adopted the policy of providing free navigation facilities. Many projects for which Congress had made land grants or stock subscriptions in the previous period were now purchased by the Government. This was done in all instances of canals which were important connecting links in navigable rivers or lakes.

Although the act of 1866 had required commercial statistics as the basis for the authorization of projects, political influence and local contribution were more important factors in securing Federal assistance. The engineers were unable to determine the amount of existing commerce on the rivers, and estimates of future commerce

9. 14 Stat. 70.
10. See 15 Stat. 169, and 20 Stat. 140.

which might result from improvement of the waterway were greatly exaggerated by local enthusiasm. The fact that a locality had previously undertaken to make improvements, or was willing to cooperate with the Federal Government, was always a strong argument for the adoption of projects. Projects were viewed entirely from a local rather than national viewpoint. Many improvements were authorized, but the appropriations for each were so limited and irregular that only a few of the smaller projects were completed. Once a project had been adopted, it was included in the list for appropriations indefinitely.

In 1882 President Arthur attempted to check the policy and vetoed the ommibus bill. In his veto message, the President maintained that the bill was entirely for the benefit of particular localities and that the policy was leading to increased demands from particular sections of the country which could not be denied. "Thus, as the bill becomes more objectionable, it secures more support."[11] The bill was passed over the veto but the friends of river improvement became somewhat discouraged. Many of them were defeated in the following election, which served as a further check to large appropriations and the authorization of new projects. After 1882 the rivers and harbors acts were biennial.

In 1896 President Cleveland followed the example of President Arthur. The bill in that year made appropriations of $14,000,000 (plus $3,000,000 in another bill already approved), and authorizations of contracts for river and harbor work amounting to $62,000,000. Surveys were authorized in thirty-six states which would undoubtedly lead to new projects. There were 417 items of appropriations in the

11. Veto message of President Arthur, August 1, 1882.

bill. President Cleveland vigorously objected to the amount of expenditures contemplated and to the purpose of the bill.

> "Many of the objects for which it appropriates public money are not related to the public welfare and many are palpably for the benefit of limited localities or in aid of individual interests.
>
> On the face of the bill it appears that not a few of these alleged improvements have been so improvidently planned and prosecuted that after an unwise expenditure of millions of dollars new experiments for this accomplishment have been entered upon."[12]

Again the bill was passed over the presidential veto, but it was unquestionably a blow to the policy of improving waterways. The result of the veto was that bills came less frequently. After 1896 they appear at three year intervals. The situation with regard to appropriations for river and harbor improvements was thus much the same at the close of the century as it had been at the close of the period prior to the Civil War. There was widespread objection to the policy in that it advanced local interests rather than the general welfare and accusations of "log-rolling" were freely hurled at Congress. The railroads, naturally objecting to any improvement of navigation on inland waterways, both directly and indirectly aided in discrediting the policy. At the same time there were active organizations demanding the completion of large waterway projects, such as the Western Waterway Association (Mississippi Valley interests), the Lake Carriers' Association, the Ohio Valley Improvement Association (which organization urged a nine-foot channel from Pittsburg to Cairo and in the principal tributaries of the Ohio River), the Atlantic Deeper Waterways Association (which advocated a continuous inland route from Boston to Jacksonville), the Columbia

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12. Veto message of Grover Cleveland, May 29, 1896.

River Association, and many others.[13] These organizations kept their particular projects before Congress and repeatedly demanded their completion.

Rise of Interest in Water Resources After 1900

After 1900 there was a very noticeable increase of interest in waterways which led to criticism of previous policy. This interest included not only the improvement of navigable rivers, but also the use of water resources for other purposes, the conservation of water, and the protection of watersheds. Demands were presented to Congress for a complete over-hauling of the policy relating to improvement of navigable rivers, for the completion of projects which had long been in progress, for the removal of such projects from the influence of politics and for the coordination of uses and control of water resources. Bills were introduced for the creation of special administrative boards with large discretionary power over the improvement of waterways; for the issuance of bonds to complete authorized projects; and for the creation of a commission to coordinate policy with respect to water resources.

The principal causes of this agitation were (1) the growing importance of water for other uses, such as irrigation and water power; (2) the conservation of resources movement led by President Roosevelt; and (3) the widespread antagonism toward the railroads. Water power was just beginning to be recognized as an important source of energy which might have a very promising future. The

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13. For a more complete list of these organizations see the article by Joseph E. Ransdell, "Legislative Program Congress Should Adopt for Improvement of American Waterways", Annals of the American Academy of Political and Social Science, Vol. 31, No. 1, p. 36.

development of policy with respect thereto is considered in Chapter IV. Irrigation was likewise rapidly becoming an important aspect of the water resources problem, particularly, of course, in the arid Western states. Federal policy with regard to irrigation and reclamation is the subject of Chapter III.

The adoption of a policy to conserve national resources was vigorously advocated during the Roosevelt administration. One of the aspects of this program was the improvement of inland waterways, one of the greatest of our natural resources, which would permit a full economic and social development of the interior of the country. Speaking in 1907, President Roosevelt made the following statement:

> "In wealth of natural resources no kingdom of Europe can compare with the Mississippi Valley and the region around the Great Lakes. . . . The Mississippi Valley is a magnificant empire of size and fertility. It is better adapted to the development of inland navigation than any other valley in either hemisphere; for there are 12,000 miles of waterway now more or less fully navigable, and the conditions are so favorable that it will be easy to increase the extent of navigable waterways to almost any required degree of canalization.
>
> Such being the case, and this valley being literally in the heart of the United States, all that concerns its welfare must concern likewise the whole country. Therefore, the Mississippi River and its tributaries ought by all means to be utilized to their utmost possibility. Facility of cheap transportation is an essential in our modern civilization, and we cannot afford any longer to neglect the great highways which nature has provided for us."[14]

To achieve this purpose, Roosevelt offered many constructive suggestions for the future national policy with respect to inland waters as to the proper distribution of costs, the provision of adequate terminal facilities, the prevention of floods, the formulation of a comprehensive plan which would be considered from the

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14. From an address delivered by President Roosevelt to the Deep Waterway Convention at Memphis, October 4, 1907. Reprinted in the Annals of the American Academy, op. cit., p. 1-3.

national rather than the local viewpoint, and the coordination of uses of water resources.

> "Planned and orderly development is essential to the best use of every natural resource, and to none more than to the best use of our inland waterways. In the case of the waterways it has been conspicuously absent. Because such foresight was lacking, the interests of our rivers have been in fact overlooked, in spite of the immense sums spent upon them. It is evident that their most urgent need is a farsighted and comprehensive plan, dealing not with navigation alone, nor with irrigation alone, but considering our inland waterways as a whole, and with reference to every use to which they can be put. The central motive of such a plan should be to get from the streams of the United States not only the fullest but also the most permanent service they are capable of rendering to the Nation as a whole."[15]

The advocates of conservation and the proper use of water resources found allies in what might be called the "anti-railroad movement". In the period preceding the World War, the railroads had practically a complete monopoly of transportation and this power was used to its utmost. There were several aspects of this movement for water transportation as related to the railroads. In the first place, there was a decided problem during the early part of the century as to the adequacy of the railroads as the exclusive transportation agency of the country. Numerous instances were cited in hearings and congressional debates where freight had been sidetracked for weeks. During 1906 and 1907 there was serious congestion and shortage of cars to handle freight which brought losses to the farmers in the South and the West. For this reason, water transportation was advocated as a supplement to the railroads. By relieving the railroads of much of the bulky low-grade traffic, better service could be rendered.

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15. Ibid., p. 3.

A somewhat different aspect of the problem was the demand for water transportation because it would be much cheaper than the railroads. Here again, the waterways were viewed as supplementary to the railroads, handling bulky goods of low value. But this movement of goods by water was seen as resulting in a great saving to the public, in the increased prosperity of farmers, miners and producers of these goods, and the movement of industry and population from the heavily populated sections of the country along the eastern coast. Furthermore, an increase of total traffic was anticipated.

A third aspect of this movement for navigable waterways is found in the arguments for water transportation as a competitor of the railroads, as a means of forcing rate reductions. The use of water transportation as a "big stick" over the railroads was stated in definite form by President Roosevelt in the address cited above as follows:

> "The natural highways, the waterways, can never be monopolized by any corporation. They belong to all the people, and it is in the power of no one to take them away. Wherever a navigable river runs beside railroads the problem of regulating the rates on the railroads becomes far easier, because river regulation is rate regulation. When the water rate sinks, the land rate cannot be kept at an excessive height. Therefore it is of national importance to develop these streams as highways to the fullest extent which is genuinely profitable."

In the reports of the Army Engineers, the hearings on the improvement of certain rivers and in the congressional debates on the rivers and harbors bills, this argument that water transportation will cause a lowering of freight rates continually arises.[16] The

16. In the report on the Willamette Falls Canal the district engineer stated: "Supposing the tolls abolished and the entire benefit given producers, the direct saving to them would be over $39,000 while the indirect saving due to corresponding reduced rail rates it would be impossible to estimate without access to the books of the Southern

important difference between this aspect of the problem of the relation of waterways to railroads is that, in this case, the waterways may never actually be used. But they will always stand ready for use as a substitute means of transportation. For example, Representative Pierce stated during a hearing on the Columbia River that he believed the Mississippi River had justified every dollar put into it, even though it might never be used for water transportation.[17]

The National Rivers and Harbors Congress was organized in 1901 to unite all waterway interests and press the adoption of a comprehensive program by Congress for the completion of river improvements. The association was composed of a large number of individuals, corporations, commercial organizations and waterway associations from thirty-three states. It advocated annual appropriation bills of from $50,000,000 to $100,000,000 which would provide for the completion of projects as rapidly as possible. It further advocated the creation of a department of transportation with full charge of all matters relating to highways, railroads, and waterways.

(Con't.) Pacific Railway Company, though this would be unquestionably much greater still." (H. Doc. 212, 56th Cong., 1st sess.)

In the report on the Cumberland and Tennessee Rivers, the Board of Engineers stated: "In the improvement of all our interior rivers their power to control the cost of transportation is the factor of paramount importance, and the Ohio River, owing to the configuration of its watershed, does not afford so controlling an influence over the cost of railroad transportation as the Cumberland and Tennessee Rivers." (Sen. Doc. 83, 59th Cong., 1st sess.)

Also see the hearings on the Savannah River below Augusta, before the House Committee on Rivers and Harbors, 70th Cong., 1st sess.; and on the Columbia and Snake Rivers, 74th Cong., 1st sess.

17. Hearings on the Columbia and Snake Rivers, op. cit., p. 6.

The outgrowth of this general agitation for improvement of rivers and the formulation of a definite policy with regard to water resources was the creation of the National Waterways Commission in 1909.[18] The final report of the Commission discussed many important problems relating to the improvement of waterways and better utilization of water resources.[19] Recommendations were made regarding further legislation for protecting waterways from railway competition and for establishing more amicable relations between the two agencies of transportation, for the control of public terminals, and for the development and control of water power. The report considered the practicability of impounding reservoirs for flood prevention and aiding navigation, the influence of forestation upon the navigability of streams, and the most salutary policy for the prevention of soil erosion. The report was a disappointment, however, in that it did not indicate a desirable coordinated plan for the improvement of waterways or propose a program for coordinating the various uses of water.

The idea of a comprehensive plan for the development of water resources can be attributed primarily to Senator Newlands of Nevada, and he labored unceasingly for many years to secure the creation of a Waterway Commission. He introduced numerous bills into Congress and presented the proposition on innumerable occasions on the floor of Senate. With the increase of public interest in waterways during the period from 1900 to 1910, Senator Newlands believed the time had arrived for the adoption of a comprehensive plan.

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18. 35 Stat. 815, sec. 7.
19. Sen. Doc. 469, 62d Cong., 2d sess.

> "The important thing, now, is to give effective direction to this aroused public sentiment by explaining the true scope of the subject and the importance of scientific legislation for carrying out the comprehensive plans which, alone, will make the undertaking successful."[20]

Although no immediate action was taken to formulate such a policy, there is no question but that the ideas of Senator Newlands were instrumental in directing public opinion and subsequent legislation.

Policy with Respect to Improvement of Rivers after 1900

The increase of national interest in the subject of inland waterways and water resources after 1900 which led to the creation of the National Congress of Rivers and Harbors and the National Waterways Commission revealed certain problems which demanded consideration in the formulation of future policy, such as the role of politics in determining policy; the adoption of future projects; policy regarding local contributions; the completion of projects; and the relation of navigation to other uses of water. The analysis of the development of policy after 1900 will, accordingly, be treated from the viewpoint of these specific problems.

The removal of appropriations from politics.

Obviously, if the river and harbor appropriation acts were to carry out a plan of improving inland waterways based on national importance, these bills must be removed from the pressure of local interests. As long as congressional representatives continued to think in terms of their own local projects and to vote in favor of the bill when these projects were included, without giving serious thought to the bill as a whole, there could be little hope of formulating a

20. Newlands, Francis G., "The Development and Use of American Waterways", Annals of American Academy, op. cit., p. 50.

national plan which would look first to the improvement and maintenance of the most important rivers, and delay smaller projects for later action.

In order to meet this situation and remove appropriations from politics, the Board of Engineers for Rivers and Harbors was created in 1902, consisting of seven officers detailed from the Corps of Engineers of the United States Army.[21] They were directed to make all reports on examinations and surveys provided for by Congress and to submit recommendations to the Chief of Engineers as to the desirability of commencing or continuing improvements upon which reports were required. In making such recommendations, the Board should have in view the amount and character of commerce existing or reasonably prospective which would be benefited by the improvement, and the relation of the ultimate cost of such work to the public commercial interests involved.

With a few minor exceptions, no projects for improving rivers have been authorized since 1902 until surveys and examinations were made by the Board and the project in question reported favorably. To this extent the Board has been successful in removing projects from politics. There have been criticisms and objections, of course, to the policy of accepting only those projects which have been recommended by the Board, but these objections have come primarily from those congressmen whose local projects failed to receive a favorable report from the Engineers.[22]

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21. 32 Stat. 372.
22. For example, in 1907 Representative Pujo stated to the House that the rights of the membership of the House and the Committee on Rivers and Harbors were practically taken away when this Board was created. He then requested that the House resume its legislative prerogative by ignoring the recommendation of the Board and authorize the proposed inland waterway from the Rio Grande to the Mississippi. (Congressional Record, Vol. 41, Part 3, p. 2364.)

The principal criticism in the creation of this special board was the failure of Congress to grant the agency any discretionary power and the retention of the previous method of making appropriations. Projects continued to be primarily local in nature. The Board was allowed no initiative in the matter of surveys and examinations,[23] and their recommendations, consequently, referred only to the particular local project which they were ordered to survey. The river and harbor acts after 1900 contained authorizations and appropriations for a great many projects located in all sections of the country and continued to provoke accusations of log-rolling. For example, the Washington Post condemned the bill of 1924 as another instance of "pork-barrel" and maintained that the present system of formulating such bills was still designed to promove log-rolling and "back-scratching".

> "The idea is that money should be apportioned to the various congressional districts for public works not according to the actual public need, but simply in such a way as will give every part of the country a share of the funds. Thus the member from Wayback will not vote to appropriate a million dollars to make the approach to the Washington Navy Yard navigable by our vessels, unless at the same time a hundred thousand dollars is appropriated to pump enough water into Wildcat Creek to make it navigable by the skiffs of muskrat hunters."[24]

Senator Duncan of Florida vigorously objected to this criticism of the Post, which he considered decidedly unjust inasmuch as no projects were authorized without the recommendation of the Board. This policy did not, however, eliminate the local aspects of appropriations, and very obviously did not result in the formulation of a national plan for the improvement of inland waterways.

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23. This question was definitely decided in 1913. (37 Stat. 826.)
24. Congressional Record, Vol. 66, Part 1, p. 918.

Adoption of new projects.

Before making any recommendation to Congress on proposed projects or extensions of previously adopted projects, the Engineers surveyed the territory which was affected by the improvement to determine the industrial and agricultural development of the region, the rate of population increase, the existing transportation facilities and adequacy and cost of such services. An attempt was also made to estimate the existing water borne commerce and value of such commerce, as well as the prospective growth of commerce. In order to ascertain existing commerce, lists were obtained of all registered vessels at the port or ports included in the project and the tonnage of each. There were no statistics available, however, as to the actual tonnage carried and the value thereof. In the hearings on the river and harbor bill in 1918, objection was made to the method of compiling these statistics in that there did not appear to be very much uniformity in the plan adopted by the district engineers.[25] In answer to this criticism, Colonel Newcomer made the following statement:

> "The question of commercial statistics is one of the most perplexing with which we have to deal, because there is no law which requires manifests to be made out for all the movement of freight. . . . We simply have to get that when the companies are willing to give it to us, at the end of the year. Many of them do not keep their books in such shape as to enable them to do that satisfactorily. . . . . Where there is no lockage, but simply a movement from point to point, we do not have our agents following up this thing all the time. It would be a very expensive proposition to do that, to secure the statistics of such movements, but we have not been able to devise a program which did not seem too burdensome and yet permit us to get results."[26]

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25. Hearings on H. R. 10069 before the Committee on Rivers and Harbors, 65th Cong., 2d sess., p. 35.
26. Ibid., p. 37. To assist the Engineers in acquiring this information, an act was passed in 1922 providing that all owners, agents and masters of vessels on the navigable waters

Even greater difficulties were realized in the attempt to ascertain the probable growth of commerce which would result from the improvement in question. Hearings were held in the locality affected to obtain an expression from local interests as to the amount of commerce which would probably be shifted from rail to water transportation and the new industry likely to develop in the community which would add to the use of the water facilities. Public enthusiasm and optimism was generally so high at these hearings that the Board felt obliged to seriously question the statements made. Unquestionably, the existence of a few large shippers has been influential in determining the recommendations of the Board. In such cases, the increase of commerce was practically assured.[27] The Board could feel much safer in recommending the adoption of the project than in cases where the prospective commerce was to come from a great many small shippers within the territory, none of whom could afford to have boats of their own, but had to rely on common carriers.

Inasmuch as the basis of approving projects has been fundamentally a comparison of present and prospective commerce with the

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(Cont'd.) of the United States, and all individuals and corporations engaged in transporting their own goods should furnish any statements relative to vessels, passengers, freight, and tonnage as required by the Secretary of War. (42 Stat. 1038.)

27. For example, in the report of Suisun Channel the district engineer stated: "Since the submission of Major Heuer's report, there has been established within five miles of Suisun, on the branch of the Southern Pacific Railway Company, the Pacific Portland Cement Company. This company ships via the railroad, and states that it has suffered greatly due to inadequate car service. The cement company further states that if the creek be made navigable, the company will construct three miles of railway, costing $250,000, to make connection with the water, and estimates an output of three hundred tons a day." (H. Doc. 1110, 60th Cong., 2d sess., p. 3.)

cost of the improvement, the importance of securing accurate commercial statistics is apparent. The question as to whether the benefit of cheaper transportation will go to large shippers or hundreds of small producers has been relatively unimportant. The further question as to the scope of the project, whether purely local or primarily national, although often discussed in the reports and before Congress, has had little effect on the ultimate decision as to the adoption of the project. The movement of goods and the saving which will result from the use of water rather than the railroad has been the deciding factor.[28] With regard to navigation policy in the future, the Mississippi Valley Committee in its report of October 1, 1934, stressed the need of new estimating, accounting and cost-finding technique, not only to weight the advantages and disadvantages of river transportation, but to determine the proper place of inland waterways in a coordinated national transportation system. The Committee further suggested that it may be desirable to introduce a new element by imposing charges when they are justified by special service and special facilities and when the traffic can bear them.

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28. The report on Biloxi Harbor stated: "Any improvement of the channel at Biloxi will benefit a purely local commerce. . . (however). . . it appears that a considerable proportion of the industries would be benefited if deeper draft could be carried into the Back Bay. . . In view of the commerce to be benefited and the probably small cost of the improvement contemplated, it is my opinion that the locality is worthy of improvement by the general Government. . ." (H. Doc. 1088, 60th Cong., 2d sess., p. 5.)
Also see Swift Creek, H. Doc. 360, 61st Cong., 2d sess.; Bayou La Batre, H. Doc. 316, 61st Cong., 2d sess.; Yahara River, Wisconsin, H. Doc. 398, 61st Cong., 2d sess.; Chehalis River, H. Doc. 1125, 60th Cong., 2d sess.; New River, H. Doc. 1085, 60th Cong., 2d sess.

Local contribution.

In the committee hearings and congressional debates on waterway projects, there has been a tacit acceptance of the fact that local and private interests should pay for purely local benefits, and that the Federal Government should undertake only those projects, at national expense, which result in national benefit; recognizing, however, that both local and national benefits may result from amy project. In the rivers and harbors act of 1920, Congress provided that "every report submitted to Congress in pursuance of any provision of law for a survey . . . shall contain a statement of special or local benefit which will accrue to localities affected by such improvement and a statement of general or national benefits, with recommendations as to what local cooperation should be required, if any, on account of such special or local benefit."[29]

The problem, however, of determining the nature and extent of the benefits from water transportation facilities is exceedingly difficult. To any particular shipper, the benefit from lower freight rates will depend upon many factors, such as the market price of his good, the ability of his competitors to enjoy equal advantages, and the importance of transportation costs in the production and marketing of the good. The particular locality benefits from the improved transportation facilities by a general increase in industrial and commercial activity. A national benefit may result from water transportation by the redistribution of industry and population, the settlement of heretofore isolated regions, the improvement in the social and economic wellbeing of a large group of people, or the general lowering of prices of food products and manufactured goods.

29. 41 Stat. 1010.

Any attempt to isolate these various benefits, however, in monetary terms and allocate costs on the basis thereof, would be probably a hopeless task.

To carry out the mandate of Congress, the Board has devised certain rule-of-thumb measures, but the actual division of costs between the Federal Government and the locality or private interests has been determined by the relatively simple process of bargaining. A survey of the reports of the Board indicates that the benefits from waterway improvement have been considered to be national in scope whenever foreign trade was an important item; a large volume of existing or potential commerce was included; the waterway to be improved was of considerable length; or the commerce was of a general nature, originating from many producers and destined for many consumers.[30] Conversely, the benefits were considered to be local wherever the project or extent of traffic was small in scope; the facilities would be used primarily by a particular group of people, such as the fishing interests; or if used by a small number of large shippers.

As a matter of economic and political expediency, the Board has adopted the following general rules with regard to local benefit and local cooperation:

1) In the first place, as has been previously discussed, no project was rejected simply because it would confer local rather

30. In the report on the Appalachicola Bay, Florida, the Board stated: "While the benefits to be derived are largely local, their application is general to many small interests, and no plan for local cooperation is considered practicable or necessary." (H. Doc. 106, 69th Cong., 1st sess.)
Also see reports on the Youghiogheny River, H. Doc. 253, 69th Cong., 1st sess.; Allegheny River, H. Doc. 721, 71st Cong., 3d sess.; Mobile River, H. Doc. 728, 71st Cong., 3d sess.; and Pocomoke River, H. Doc. 227, 74th Cong., 1st sess.

than national benefits. Wherever the saving in transportation costs was equivalent to or more than the estimated cost of the project, Federal action was recommended.

2) Secondly, wherever the project required the attainment of lands in private ownership, the Board has generally required that the local interests should furnish the right of way to the Government free of cost.[31]

3) In cases where a small group of large shippers would realize material benefit from the improvement in the way of lower transportation costs, they have been required to make certain contributions. For example, in the case of the improvement of Redwood Creek, California, the Pacific Portland Cement Company was required to pay one-half of the first cost of the improvement, as well as supply suitable dumping grounds for spoil material and the necessary bulkheads, inasmuch as it was the chief beneficiary of the improvement.[32]

4) Since 1920 assurances have been required that the localities affected by the improvement will provide adequate terminal facilities.

5) Special requirements have been stipulated in certain cases, depending upon the particular conditions. For example, in connection with the Intracostal Waterway from the Mississippi River to Corpus Christi, Texas, the Board recommended that "local interests shall defray the cost of constructing or remodeling all highway bridges, together with their subsequent maintenance and operation. Further-

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31. See reports on the Waterway from Charleston to Savannah, H. Doc. 627, 63d Cong., 2d sess.; Inland Waterway near Jacksonville, H. Doc. 67, 74th Cong., 1st sess.; Pocomoke River, H. Doc. 227, 74th Cong., 1st sess.; Mantua Creek, H. Doc. 523, 74th Cong., 2st sess.

32. See reports on Redwood Creek, H. Doc. 142, 70th Cong., 1st sess.; the Savannah River, H. Doc. 261, 69th Cong., 1st sess.; Willemette River, H. Doc. 372, 72d Cong., 2d sess.; Grand River, H. Doc. 103, 70th Cong., 1st sess.

more, they shall assure the Board that by the date of completion of the improvement, adequate vessels, terminals and auxiliary equipment shall be available for the economical handling of a specified amount of commerce."[33]

The initiative with regard to local contribution has come primarily from these interests themselves. The improvement of a particular river is desired and preliminary overtures are made to the district engineer to ascertain what inducements will probably be necessary before the Board will look upon the proposition with favor. The project may be entirely a local one, it may benefit only a few shippers, and there may be no commerce in sight; but a sufficient display of local enthusiasm combined with an offer of cooperation has generally resulted in the adoption of the project. In the report on the Savannah River, the Board stated:

> ". . . the commerce during recent years does not in itself appear to justify any large expenditure by the Federal government at the present time. The city of Augusta has, however, shown a great interest in water transportation by purchasing and operating a freight boat, while the city council has adopted a resolution pledging assurance that suitable vessels will be provided to transport a minimum of 125,000 tons annually, with necessary terminals andother equipment, and that all necessary land and easements will be provided for a canalization project."[34]

The Board accordingly recommended the adoption of the project. The Oconto Harbor is another good example of a project which received a favorable report after the local interests had expressed willingness to cooperate. As stated by the Board:

> "This places the matter on a different basis, for while the cost of the improvement might be considered excessive when compared with the commerce involved if the whole expense is to be borne by the United States,

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33. H. Doc. 238, 68th Cong., 1st sess.
34. H. Doc. 101, 70th Cong., 1st sess.

it might not be so considered if local interests bear a part of such expense."[35]

This general procedure of offering inducements to the Federal Government was summarized by Chairman Dempsey of the House Committee on Rivers and Harbors at the hearings on the omnibus bill of 1928 as follows:

> ". . . again and again, every part of the United States, people come in and say, 'We are willing to match our money with Government money; we are satisfied we are going to have commerce; we live there, we know the locality, and to induce the government to invest we are willing to advance fifty cents for the dollar that the government appropriates."[36]

When objections were made to this policy on the ground that the Government had been led to make expenditures of many millions of dollars in the development of rivers which would never have been taken over had it not been for the inducements of private interests who were willing to contribute to the cost of the project, the Chairman stated that it was not advisable to consider going back on the well-established policy which had prevailed for many years.[37]

Improvements have also been undertaken by private and local interests and then brought to the Federal Government for adoption as Federal projects. In many instances these were first suggested to Congress for adoption by the Government but were refused. After the project was partially completed, it was resubmitted to Congress.[38] After 1930 many localities were unable to meet the demands for

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35. H. Doc. 538, 71st Cong., 2d sess.
36. Hearings on H. R. 14066 before the House Committee on Rivers and Harbors, 70th Cong., 1st sess.
37. Ibid., p. 123-25.
38. For example, local interests constructed a channel in Coos Bay under the supervision of the Government. By 1918 it had deteriorated in certain places and needed to be reconstructed. The people in the locality were unable to do this because they had obligated themselves as far as the law would allow. The project was surveyed by the Engineers at that time and reported favorably in view of the work already done and the amount of commerce. (H. Doc. 325, 65th Cong., 1st sess.)

local contribution which they had agreed upon with the Board when their projects were first surveyed. In these cases the Board recommended that the Federal government bear the entire cost of the project.[39] The recent trend of policy, therefore, is to excuse local and private interests from cooperation, on which agreement had previously been reached, because of recent financial difficulties.

In conclusion, it is apparent that there is no definite formulation of policy regarding local contribution. It is primarily a bargaining process, in which the local interests attempt to secure the improvement with the least local expenditure. In 1924, as Chairman of the House Committee, Representative Dempsey explained this lack of uniform policy to the House as follows:

> "I think probably the time will come when we will have to adopt a uniform practice with regard to local contributions, but the gentlemen can see how hard it is to do so. A locality comes in and asks for the adoption of its project. It is so tremendously interested in the project that it is willing and offers and urges, in order to have the project adopted, and speedily adopted, to contribute such and such proportion of the improvement . . . So it is impossible for the committee to say, 'No; we will not receive it; but that is the obstacle to a uniform policy in that regard."[40]

The situation remains the same today.

(Cont'd.) Other examples of local undertakings which were later brought to Congress for completion and maintenance are the Great Salt Pond project, H. Doc. 313, 61st Cong., 2d sess.; the Barnegat Inlet, see hearings on H. R. 8890 before the House Committee on Rivers and Harbors, 73rd Cong., 2d sess., p. 20-22; the Coquille River, H. Doc. 70, 65th Cong., 1st sess.; the Lake Charles project, H. Doc. 172, 72d Cong., 1st sess.; and the Ft. Pierce Inlet, see hearing before the House Committee, 72d Cong., 1st sess.

39. See hearings on H. R. 8890, House Committee on Rivers and Harbors, 73d Cong. 2d sess. p. 6-7; and the hearings before the Committee on the river and harbor bill of 1932, 72d Cong., 1st sess., p. 113-116.

40. Congressional Record, Vol. 66, Part 2, p. 1882.

Completion of projects.

After 1900 the completion of projects which were authorized and partially finished was repeatedly advocated. To spend millions of dollars on parts of a project was unquestionably a wasteful and useless practice. Water transportation could not be developed until important termini were connected. And to leave short sections of a waterway unimproved rendered all other improvements practically ineffective. As a result of the agitation for the completion of projects, the rivers and harbors act of 1910 stated that the improvement of the Mississippi River, from its mouth to Minneapolis, and of the Ohio River from Pittsburgh to Cairo, should be continued with a view to completion within a period of twelve years.[41] These provisions had no binding effect, however, on succeeding Congresses. The bill contained, in addition, hundreds of other projects. It contemplated the completion of the inland waterway system, including the Missouri as well as the Mississippi and Ohio rivers; a deep-sea channel to Savannah; a thirty-five foot channel in the Delaware to Philadelphia; a thirty-five foot channel to Norfolk; a twenty-seven foot channel to Mobile; a thirty-foot channel to Jacksonville; and a thirty-foot channel to Oakland. The large list of adopted projects in this act was a reflection of the public interest in waterways but the actual appropriations were small. Projects were adopted with enthusiasm, but future Congresses could provide for their completion. This had been the principal difficulty with previous river and harbor acts and the reason for the extremely slow progress made in the completion of projects. The bill of 1910 did nothing to rectify this difficulty.

41. 36 Stat. 630.

When President Taft returned the bill to Congress he stated that had it not been for the urgent need of appropriations for maintenance, he would have felt it his duty to veto the bill. His opposition was based on this "piecemeal" policy of such legislation. President Taft expressed complete sympathy with the general sentiment that there should be a comprehensive system, agreed upon by some competent body of experts who should pass upon the relative merits of the various projects and recommend the order in which they should be begun and completed. He also pointed out that simply because a project had been once recommended did not mean that it would always be considered desirable. Economic conditions may have changed, thus necessitating a resurvey. Old projects, although partially completed, should be reconsidered from time to time to ascertain their present usefulness and desirability.[42] These recommendations were not accepted by Congress, however, and none of the projects contemplated in this act were completed within the twelve year period. In 1924, the Ohio River project, which had been authorized in 1878 and required fifty-two locks and dams, had been improved to Louisville, a little over half of the distance. $87,000,000 had been spent to that time and it would have required $25,000,000 to complete the project to make it useful to commerce and industry.

The congestion of traffic on the railroads during the War forced the Government to turn to the inland waterways for a supplemental means of transportation. A Division of Inland Waterways was created, as a part of the United States Railroad Administration, which operated a fleet of barges on the lower Mississippi and the

42. Sen. Doc. 651, 61st Cong., 2d sess.

Tombigbee Rivers. At the close of the War, plans had been formulated for completing improvements on the Ohio and Missouri Rivers, and on the upper Mississippi to Minneapolis. The operations of the Government had clearly revealed the inadequacy of improvements to that time and the need for completion of projects before commerce could develop.[43] No immediate action was taken, however, to accomplish this end.

In 1926 the Committee on Rivers and Harbors asked Mr. Hoover, then Secretary of Commerce, to make a statement on the status of the development of inland waterway systems in the United States.[44] This hearing is worthy of mention for two reasons: first, it is an indication that the Committee was thinking more and more in terms of a national inland waterway system. Secondly, the statement of Secretary Hoover is revealing in that his criticisms of the policy of Congress with respect to the improvement of rivers was almost identical with those made in the early part of the century by President Roosevelt, the conservationists and the Waterways Commission. The basis of this criticism and the suggestions made by Mr. Hoover are indicated in the following quotations from the hearing:

> Secretary Hoover. . . . we should visualize our inland waterways as great consolidated transportation systems rather than as disconnected individual river and canal improvements.
> The Chairman. In other words, you believe in the merger of waterways just as much as a merger of railroads has been urged by practically everyone interested in the question?
> Secretary Hoover. Yes, I believe we would here find the key to the apparent failure of inland waterways to effect the result which has been hoped for them and at the same time with the realization of our new economic setting, this conception would open and enlarge a definite program

43. See hearings before the House Committee, 65th Congress.
44. Hearings on the Inland Waterway System, House Committee, 69th Cong., 1st sess.

> of waterway development of most vital importance to the nation. . . . .
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> If we examine the possibilities in the great interior, we find that the rivers of the Mississippi drainage between the Alleghenies and the Rocky Mountains lie topographically in such a fashion that we could project a system of main trunk lines and laterals of a total of 9,000 miles in a consolidated barge system. . . . .
>
> In net result we would have a real transportation system, with about 3,000 miles of what might be called the main line, and 6,000 miles of laterals. Of course, as the Committee knows, we have been gradually improving it, deepening it, so as to permit of modern craft. But we have, as I said, conceived as local improvements, and today it lies in many disconnected segments.
>
> The Mississippi system is two-thirds physically deepened, but in disconnected sections, so that modern barges cannot operate systematically over it. The Great Lakes system lacks deepening of the connecting link to the sea, so that ocean-going vessels cannot penetrate into the lakes. As transportation systems they might be compared with the great railroad system that has occasional stretches of narrow gauge tracks. In such a case the volume of goods that could be handled would diminish to the capacity of the weakest link, and the cost of transportation would be enormously enhanced.

During the period from 1924 to 1933 appropriations were made annually with a view to completing these projects which had been adopted many years before and had been the source of continual discussion and complaint. Only a few new projects were adopted during this period. The projects providing for a nine-foot channel in the Mississippi River from St. Louis to the mouth and in the Ohio River from Pittsburg to the mouth were completed. New locks were completed on the Monongahela and Kanawha Rivers to facilitate navigation and connect with the Ohio system. The improvement of the Missouri River to secure a navigation channel six feet deep to Kansas City was vigorously prosecuted.

In 1930, under the provisions of the rivers and harbors act, the Government took over the project on the Illinois River which had been started by the State. This project provided for a six-foot channel and was completed in 1932. In the same act a new project

was adopted for the Mississippi River between St. Louis to Minneapolis providing for a series of locks and dams. The completion of the inland waterway along the Atlantic Coast, which had been advocated by the Atlantic Deeper Waterways Association for approximately forty years, was in sight at the close of this period. The Cape Cod Canal, one of the important links in the proposed waterway, was purchased by the Federal Government from private interests in 1928.

The improvement of waterways received a great impetus in 1933 from the Public Works Administration. Inasmuch as surveys for the projects were already prepared, they were ideal for the public works program. As stated by the Secretary of War, they had "the triple virtues of (1) requiring a great quantity and wide diversification of labor, (2) putting men to work promptly, and (3) producing results that would promote the common welfare and add to the permanent wealth of the Nation."[45] When the emergency appropriations were made by Congress in 1933, $370,000,000 of the fund was earmarked for river and harbor improvement. A similar amount was set aside in the appropriation for 1935. The Public Works Administration immediately authorized expenditures on those projects which would complete the plan for improving the inland waterways of the country. The principal features of this plan, as now conceived, are as follows:[46]

1) To improve the navigability of the Mississippi River for modern barge transportation from its mouth to St. Paul.

2) To improve the navigability of the Missouri River for barges from its mouth to Sioux City, Iowa. (a six-foot channel.)

3) To improve further the barge navigability of the Illinois waterway which constitutes part of the Lakes-to-the-Gulf waterway.

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45. Annual Report of the Secretary of War, 1932, p. 11.
46. Annual Report of the Secretary of War, 1934, p. 12.

4) To improve the Great Lakes-St. Lawrence seaway for the purpose of bringing ocean-going ships to the Great Lake ports.

The Ohio River and some of its tributaries, principally the Allegheny and Monongehela, have been completely improved and are carrying large amounts of commerce, principally by contract and private carriers. The channel of the Missouri River, from its mouth to Kansas City, was completed during 1934, and the eighty mile stretch from Kansas City to St. Joseph was finished during 1935. Work at present is concentrated on the 180 miles between St. Joseph and Omaha and a considerable amount of work has been done around Sioux City. Under the Public Works Administration, the improvement of the upper Mississippi was pushed as rapidly as possible.[47] The project for the upper Mississippi provides for seventeen locks and dams in all, which will convert the stream into a series of lakes and provide a reliable nine-foot channel.[48]

The great inland waterway system which was visualized in the early part of the century is, therefore, rapidly approaching completion.[49] The economic and social results of this transportation system cannot be foretold, as there are many complicated factors which must be given consideration. The expectations of the advocates of the system, however, are expressed by Secretary Dern in his annual

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47. In fact, indignation was expressed in Congress because the P. W. A. alloted a much greater appropriation for this project than had been anticipated by Congress when the project was adopted in 1930. It was felt that such action was overriding the House.

48. Navigation projects on the Upper Mississippi have cost the Federal Government, to June, 1934, a total of more than $126,000,000, for construction alone, to which the completion of the existing project will add another $91,000,000. The Mississippi Valley Committee reported that no strictly economic justification can be found for this expenditure, although it is possible that the future will tell a different story. (Report of the Mississippi Valley Committee, 1934, p. 10.)

report to Congress in 1934 as follows:

> "When this vast program shall have been completed, it will provide the United States with the most magnificant system of improved inland waterways in the world. It is confidently expected that the resultant cheap water transportation will not only reduce freight rates on farm products but will encourage industry to locate in the midst of agriculture, to the advantage of both."
> (p. 12.)

Irrespective of the amount of commerce which actually develops, these waterways will probably be maintained in the future simply because of the enormous public investment which they represent. The extent to which the facilities will actually be used will depend, however, on many other factors than the proper maintenance of the waterways. The more important of these include the provision of adequate terminal facilities, efficient port administration, the policy of the Federal Government with regard to protection of investments in railroads, the regulation of water transportation rates, and the coordination of water and rail facilities. The future of water transportation rests heavily of the treatment of these problems.[50]

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49. Down to the end of 1932 the United States Government had spent a little less than two billion dollars on river improvement, of which 94% was expended after 1882, 74% after 1906, and 46% after 1920. Of this amount, about a billion and a half dollars are chargeable to navigation alone, and about $440,000,000 to navigation on the Mississippi River system.

50. For a discussion of these problems see Harold G. Moulton and associates, The American Transportation Problem; Marshall E. Dimock, Developing America's Waterways; Johnson, Huebner and Henry, Transportation by Water; Report of the Mississippi Valley Committee; Report of the National Resources Board; Report of the Coordinator of Transportation, The Regulation of Transportation Agencies, H. Doc. 152, 73d Cong., 2d sess.; and the report of the Coordinator for 1934, H. Doc. 89, 74th Cong., 1st sess.

Coordination of navigation with other uses of water resources.

During the early years of the twentieth century, the advocates of conservation of national resources directed public attention to the fact that water transportation was not the only use to be made of water resources, nor was it the only problem to be considered in connection with river systems. The use of certain sites on streams for the generation of electric power was rapidly becoming an important factor as a source of energy. There was a growing realization of the economic possibilities of water power and the need for considering power when constructing dams as a means of improved navigation. Irrigation of arid lands was receiving increased attention as the more productive lands had been put under cultivation. Here again, irrigation generally involved dams and storage reservoirs which might offer opportunities for improved navigation and power, or these various uses might be in conflict. Another aspect of the problem, which received hearty support from the Mississippi Valley, was the protection of lands from flood waters, the reclamation of such overflow lands, and the storage of flood water for further utilization. The activities of Gifford Pinchot, then with the United States Forestry Service, directed public attention to the relation which existed between forests and rivers, and the need for protection of rivers and harbors, as well as reservoirs, from soil erosion.

Senator Newlands brought together all these elements in the problem of water utilization and embodied them in a definite plan for coordination and comprehensive planning of water resources. During the period from 1910 to 1920, he turned all his attention and unceasing efforts to the realization of this ideal. Practically

every session of Congress was confronted with a bill, proposing the creation of a waterways commission, introduced by Senator Newlands. The principal features of this plan were as follows:[51]

1) The creation of a Waterways Commission, consisting of the President and the Secretaries of War, Interior and Agriculture, in whose departments waterway problems were handled. This commission was to exercise an advisory capacity and was the coordinating feature of the plan.

2) The creation of a board of river regulation, which would be composed of the heads of all the bureaus and services concerned with the study, utilization and control of water resources. These included the Reclamation Service, the Forestry Service, the Geological Survey, the Smithsonian Institution, the Bureau of Plant Industry, the Mississippi River Commission and the Board of Engineers of Rivers and Harbors. In addition, the board was to include a civil engineer, a sanitary engineer, an hydraulic engineer and an expert in transportation. This board would do all the actual work of making surveys and plans for the proper use of water resources, which would be checked and supervised by the Waterways Commission.

3) The factors to be considered by the board in formulating plans for river regulation and utilization included irrigation of arid lands, reclamation of overflow lands, drainage of swamp lands, navigation of inland waterways, coordination of water and rail transportation, water power, control of flood waters, and the protection of watersheds.

4) In formulating plans, the board was to confer and cooperate with all local interests and agencies of the States, including municipalities, irrigation and drainage districts, public corporations,

51. See Appendix A.

individuals and private corporations. All local and special benefits should be ascertained as a basis for the allocation of costs and the responsibilities of the project.

This ideal of coordination was unquestionably a desirable one, and a highly necessary step in the conservation and proper utilization of water resources. The scope of the project was, however, too immense and public opinion had to be educated before it would accept or advocate national planning on such a comprehensive scale. Furthermore, the plan met with definite opposition from many sources, such as

1) The railroad interests, who opposed the revival and expansion of inland waterway competition;

2) Politicians, who did not desire the elimination of the politically powerful levee boards;

3) Power site interests and speculators, who did not want Federal regulation of water power sites;

4) Financiers, who did not wish to see an efficient and coordinated system of Federal internal improvements;

5) Congressmen, who wanted to retain full power over appropriations and consider waterway projects as separate and distinct units. This opposition generally expressed itself as objecting to bureaucratic power of an administrative agency; and

6) The multitude of small local and private interests who feared such a national plan might work to their disadvantage.

In spite of this opposition and the propaganda for the defeat of the plan, it slowly gained popularity and congressional approval, which resulted in the creation of the Waterways Commission in 1917.[52]

52. 40 Stat. 250, Sec. 18. See Appendix B.

This Commission was to consist of seven members, appointed by the President, from civil life or from the public service. The duties of the Commission were to make all necessary examinations and formulate plans for the comprehensive development of water resources, indicating the jurisdiction and rights of local and private interests. The Commission was, however, to be merely an investigatory body and not an administrative agency. Unfortunately, the War prevented the carrying out of this mandate and the Federal Water Power Act of 1920 repealed this provision of the act of 1917. The death of Senator Newlands brought to a close his long fight for comprehensive planning with apparently no results.

The idea of planning for each river system was, however, not forgotten and continued to gain adherents. In 1925, a provision was inserted in the rivers and harbors act that the Secretary of War and the Federal Power Commission should prepare and submit to Congress an estimate of the cost of making surveys of all navigable rivers and their tributaries, "wherever power development appears feasible and practicable, with a view to the formulation of general plans for the most effective improvement of such streams for the purposes of navigation and the prosecution of such improvement in combination with the most efficient development of the potential water power, the control of floods and the needs of irrigation."[53]

In the report submitted to Congress under this mandate, the streams of the country were classified and the information necessary for each as a basis for comprehensive planning was indicated.[54]

53. 43 Stat. 1186, sec. 3.
54. H. Doc. 308, 69th Cong., 1st sess.

The Board listed approximately two hundred streams which should be examined, which surveys were authorized by the act of 1927. The greater part of these studies have been made to date and are available to the general public.[55] They are popularly known as the "308 Reports" and contain a wealth of information on the rivers within the country and comprehensive plans for their proper utilization.

With a view to reducing the cost of improving rivers for purposes of navigation, there was some attempt made to coordinate navigation with water power. In 1909 the rivers and harbors act required that all preliminary examinations and surveys include data as to the "possible development and utilization of water power for industrial and commercial purposes, and such other subjects as may be properly connected with such project." The proviso was made, however, "that in the investigation and study of these questions, consideration shall be given only to their bearing upon the improvement of navigation and to the possibility and desirability of their being coordinated in a logical and proper manner with improvements for navigation to lessen the cost of such improvements and to compensate the Government for expenditures made in the interest of navigation."[56] A survey of the examinations and recommendations of the Board of Engineers after this date reveal that the following general rules were adopted in regard to coordination of navigation

55. In this connection it is interesting to note that many of the reports, although completed, were not published because of lack of funds. After President Roosevelt took office, he ordered that these reports should be made available. Much of the work undertaken by the Public Works Administration is based on the recommendations in these reports.
56. 35 Stat. 815.

and power:

1) Insofar as the mandate of Congress specifically limited such coordination to those instances where the generation of power might bear a part of the cost, no consideration was given to the power aspects of the problem unless there existed an immediate demand for the power. This resulted in limiting the consideration of water power solely to those projects in which industrial and public service corporations or individuals expressed an interest.[57]

2) If the site were of sufficient interest to private enterprises that they expressed willingness to develop it at their own expense, the Board recommended that they be allowed to do so, provided that the proper navigation facilities were constructed. The general attitude of the Board and of Congress was that such cases amounted to pure gain to the Federal government inasmuch as improvements to navigation were provided free of cost.

3) If private interests were not willing to bear the entire cost of the project, but expressed a willingness to contribute thereto, plans were designed by the Engineers which would fulfill the requirements of power development as well as improvement to navigation. The Board then recommended that all provisions be made with the private interests before commencement of the project.[58]

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57. See the reports on the Arkansas River, H. Doc. 206, 61st Cong., 2d sess.; the Wabash River, H. Doc. 246, 61st Cong., 2d sess.; the Canal connecting Lake Superior and the Mississippi River, H. Doc. 304, 61st Cong., 2d sess.; and the Obey River, Tenn., H. Doc. 319, 61st Cong., 2d sess.

58. See report on Cape Fear River, N. Carolina, H. Doc. 786, 71st Cong., 3d sess.; and on the Savannah River, H. Doc. 64, 74th Cong., 1st sess.

The writer has found but one instance where the subject of reclamation was definitely related to navigation, and that was by special mandate. In 1915 a reexamination was made of the adopted project for the improvement of the Fox River, to ascertain whether it should be abandoned or modified. Congress directed that this examination should also include a survey of the possibilities of water power and the reclamation of land by drainage. In the interests of water power, the Chief of Engineers recommended certain changes in the project; no expenditures to be made, however, until the water power interests were prepared to cooperate to the extent of paying a "fair value for the benefits received under lease safeguarding the interests of the United States."[59] A plan for reclaiming 76,260 acres of fertile land subject to overflow, at a cost to local interest of from $4,258,000 to $4,401,000 was also included. The Board recommended that the Government contribute to the plan by making certain necessary modifications in the dams on the lower river at a total cost of approximately $200,000. Such changes should be made only when actual land reclamation had been undertaken. This report is of particular interest for the Board expressed the belief that "the improvement should be considered as a whole and neither the water power nor the reclamation project be adopted as a separate improvement."[60] This is one of the few instances where the Board recommended some degree of comprehensive development at the initiative and under the supervision of the Federal Government. With these few exceptions, however, navigation has been treated as a separate aspect of water utilization and has not been coordinated with other uses of water.

59. H. Doc. 146, 67th Cong., 2d sess., p. 7.
60. Ibid., p. 8.

Summary.

The following general conclusions can be drawn from the preceding survey of national policy with respect to the improvement of navigable rivers:

1) The theoretical justification for the adoption of projects by the Federal Government has been the development of commerce and the saving in transportation costs, which would benefit either the producers or consumers of the goods transported by water. Actually, political influence, private economic interests, previous expenditures by localities, and the willingness of local interests to share in the cost of the project, and the use of water facilities as a means of securing lower railroad rates were important factors in the development of policy.

2) No policy was formulated with respect to the allocation of costs between private shippers, the localities interested in the project, and the Federal Government. The extent of such cooperation was determined by the bargaining process.

3) There was no national plan for the development of a waterway system. Congress has retained complete jurisdiction over the adoption of projects and the allotment of funds for each specific project, which were viewed from a local viewpoint. Many projects were authorized, but the work was prosecuted in an irregular and haphazard manner over a long period of years.

4) The extensive waterway system visualized by the proponents of water transportation many years ago is now gradually nearing completion. Irrespective of the economics of the question, these waterways will unquestionably be maintained because of the enormous investment which they represent.

5) The most important problems at the present time is the promotion of the use of these facilities, which depends, in large measure, on the provision of adequate terminal facilities, the future policy of the Government with respect to the protection of the railroad interests, and the coordination of rail and water facilities.

6) Navigation has been treated by the Federal Government as a separate use of waterways, bearing no particular relation to any other aspect of the proper utilization of water resources. Water power was considered in conjunction with navigation only insofar as it might bear a part of the cost. Attempts were made, particularly by a small group in the Senate, to broaden the policy of the Government to provide for a coordinated treatment of water resources, with a view to the proper utilization and conservation of these resources. At the insistance of this group, the Army Engineers were directed in 1927 to make a complete survey of all the important rivers in the country. These studies, which have now been completed, lay the foundation for national planning with respect to the future improvement of rivers for navigation in relation to other aspects of water utilization.

CHAPTER II.

FEDERAL FLOOD CONTROL POLICY

Federal concern over the control of floods throughout the country is generally considered to be a recent development of national policy. Actually, Federal attention was directed to floods early in the nineteenth century. The origin of flood control policy lies in the policy of Congress to provide and maintain navigable waterways. The emergence of flood control policy in its own right, as a separate and distinct factor from the improvement of rivers for the purposes of navigation, is a long and interesting story.

In any consideration of flood problems in the country, the Mississippi River has necessarily dominated the picture. There have been, of course, floods on many other rivers which have caused great damage to property and to crops as well as the loss of life. Nevertheless, the great length of the Mississippi, the enormous area drained by that river and its tributaries,[1] and the frequency of damaging floods in the lower valley,[2] has given the Mississippi first consideration as the principal flood control problem in the country. The beginning of national policy for flood control, consequently, lies in the treatment of the problem in the lower Mississippi Valley.

The first Mississippi flood which is recorded in American history occurred in 1543. An account of this flood is given by

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1. The Mississippi drains 42% of the entire area of the United States; an area in which occurs some of the heaviest rainfall. Thirty-two states are included in the drainage area.
2. There is a flood in the lower Mississippi valley every spring which puts the river out of its banks, and every few years (on the average of about once in five years) there is a great flood.

Garcilasco de la Vega in a history of De Soto's expedition on the North American continent, and revealed that such floods had been occurring for centuries.[3] With the growth of population in the Mississippi Valley the flood problem became increasingly serious. The first levee was constructed by New Orleans in 1717. There has been a steady growth of levee building since that time. At first levees were built by individuals to protect their farms, and by towns to protect their property. As long as a large part of the land contiguous to the river remained uninhabited and uncultivated, these levees did not need to be very high. They simply diverted the water and it overflowed the unoccupied land on the opposite side of the levee. With the growth in population and settlement of the valley, however, the problem of protection from flood became a more serious and expensive proposition. Levee districts were formed under state laws with the power of taxation to build higher levees along longer sections of the river than had been done by individuals or municipalities. Levees were constructed on both sides of the river and competition developed to build higher and stronger dykes, the purpose being to protect the particular city or district which was building the levee. The flood waters would, of course, break through wherever the levees were the weakest.

In 1822 Congress ordered the Army engineers to study and make a report on the Mississippi River with the view to making the river safe for navigation. The cost of the undertaking was found to be far too great, however, for the Federal Government to assume in the interests of navigation, and the lower valley continued to build levees at individual and local expense. With the growth of settle-

3. Editorial, "Flood 400 Years Ago", Literary Digest, Vol. 94, (July 30, 1927), p. 22.

ment, the upper valley demanded navigation to New Orleans and the problem of floods, which interfered with navigation, was again brought to the attention of Congress. Conventions were held in Chicago, Memphis, Cincinnati and other cities for the purpose of securing appropriations from Congress to make the river safe. Thereupon, Congress passed the Swamp and Overflow Act, which provided that all the wet lands in the valley should be given to the several states, the proceeds of the sale to be devoted to the construction of levees and drains.[5] The net result of this act was that the wet lands of the northern valley were drained into the tributaries of the Mississippi and increased the danger of floods and need for levees in the lower basin states.

In response to local demands, Congress ordered a complete investigation of the river in 1850 and sent Lieutenant Ellet to the valley for that purpose. His report, which was submitted in 1852, considered at some length all possible means of controlling the Mississippi.[6] The question as to the proper method of flood control for the river has been a source of argument since this first report was submitted to Congress. Following Ellet, Humphreys and Abbot were sent to the valley to continue the investigation. They spent ten years at the task, and their report has been considered one of the most thorough that has ever been made of any river.[7] Very little

4. Report of Bernard and Totten, 1822, H. Doc. 35, 17th Cong., 2d sess.
5. 9 Stat. 520. The principle involved in this act was not new as the early French grants in the lower valley contained the proviso requiring the grantee to construct and maintain a levee line along the river front of his property.
6. These methods included a system of judiciously arranged levees; additional outlets during periods of high water; a combination of both; and reservoirs in the mountain gorges. (Report of Charles Ellet, 1852, Sen. Ex. Doc. 20, 37th Cong., 1st sess.)
7. Report of Gen. A. A. Humphreys, 1866, Sen. Ex. Doc. 8, 40th Cong., 1st sess.

was done as a result of their study, however, because of the Civil War, which completely eclipsed the flood problem and stopped all work on the construction of levees.

There was no recommendation in these various reports for Federal participation in the construction or maintenance of levees. The interests of navigation did not warrant such expenditure, and flood control, as such, was considered to be entirely a local and private problem. Prior to the Civil War, a large portion of the valley was fairly well protected by levees, but during that period and the years that followed, work was discontinued, many breaks occurred, and entire sections of the levee washed away. Comparatively no work was done on them for a long period and they were in an extremely weakened condition when assailed by the great flood of 1882. This flood broke the levees in 284 places and overflowed nearly the entire valley. Individuals, municipalities and levee districts were unable to meet the problem of rebuilding and repairing the levees and demands were made to Congress for assistance in reconstructing the levee system.

When the Mississippi River Commission was appointed in 1879, it was directed to consider the best methods for preventing destructive floods in its plans for the improvement of the river. And in 1882, following the flood, the policy of Federal contribution to the construction of levees was inaugerated. A lump sum appropriation of $4,123,000 was made in the rivers and harbors act of that year for the improvement of the river, to be expended under the direction of the Commission. A definite provision was added, however, "that no portion of this appropriation shall be expended to repair or build levees for the purpose of reclaiming land or pre-

venting injury to land or private property by overflows: Provided, however, that the commission is authorized to repair and build levees, if in their judgment it should be done, as part of their plans to afford ease and safety to the navigation and commerce of the river and to deepen the channel."[8]

There was apparently complete accord in Congress at that time that the Federal Government should not authorize expenditures for the purpose of protecting towns and farm lands from floods. Neither should it assist in the prevention of floods for purposes of reclaiming overflow lands. Such expenditures would be entirely to the benefit of local and private interests. The only national interest in regard to floods was in their relation to navigation. For the first ten years of Federal participation in the construction of flood control works, this provision limiting the purpose of such works was embodied in all the acts making appropriations to the Mississippi River Commission.

Beginning in 1892, this provision was no longer included in the appropriation acts and there was a general recognition of the fact that the main purpose of the expenditures by the commission for the construction of levees was simply to protect the valley from floods. Nevertheless, the fiction of navigation as the primary purpose of the appropriations was maintained. The appropriations for the lower Mississippi were made in the rivers and harbors acts in a lump sum, which was turned over to the commission for allotment. This procedure avoided any direct allotment or specific reference to flood control in the appropriation acts. Federal expenditures for flood control gradually increasing during the period from 1882 to 1910.

8. 22 Stat. 191.

There was a tacit agreement that the valley should be protected from floods and that Federal aid for that purpose was a proper function of the Government. At the same time, the Committee on Rivers and Harbors and Congress had no intention or desire to embark the Federal Government on a general flood control policy. The situation was well stated by Representative Small in 1916, as follows:

> "As a member of the Committee on Rivers and Harbors, I have voted millions of dollars for the protection of the Mississippi River, all of which was done under the guise of improving the navigation of the river and promoting commerce, and yet, in large degree, as we know, it was really intended to control the flood waters of the Mississippi River against riparian lands. . . .
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> Every intelligent member of the House has voted for millions of dollars for the Mississippi River, knowing what he was doing, knowing that a parge part of that money was for the protection of those fertile lands along that great river against floods; and yet, because we realized that the problem was so stupendous that it was beyond the financial capacity of any State to protect its lands against the river, we have shut our eyes and voted these millions of appropriations, and have done it gladly, under the guise of improving the navigability of the Mississippi. That is the truth and every intelligent members knows it is the truth."9

Rise of Interest in Flood Control

National interest in flood control was aroused in the early part of the twentieth century by the demands of the conservationists for a proper plan for the utilization of water resources. Such a plan involved the control of flood waters, not only for the protection of life and property, but for utilization in irrigating lands, in generating power, and in aiding navigation by maintenance of a constant stream flow. This would necessitate the construction of reservoirs on tributary streams to hold the flood waters back. It was generally known that the multiple purpose reservoir system had been very successful in foreign countries, particularly in Germany.

9. Congressional Record, Vol. 58, Part 2, p. 2080.

In response to the demands for such a system in this country, Congress directed the National Waterways Commission to investigate and report to Congress upon the feasibility and advisability of impounding flood waters of rivers by storage reservoirs.[10] The Commission concluded that the necessity for flood control would become of increasing importance with the development of the country and that the use of storage reservoirs, particularly if usable for other purposes as well as flood control, would be practical. At that time, however, such a method of control was deemed to expensive for either the Mississippi or Ohio Rivers. The Commission pointed out that such a multiple purpose reservoir system must be controlled and operated by some public authority.[11]

The interest in a uniform flood control policy was increased by Senator Newland's continual insistance on a comprehensive plan for the development of waterways, which gradually gained proponents in the Senate although it was not so favorably received in the House. In 1914, in connection with the question of Mississippi floods, Representative Barton attempted to show to the House that the problem was greater than one of merely preventing damage by destructive flood waters but was one, rather, of conserving and utilizing these flood waters -- to prevent both flood and drought.[12]

The National Waterways Commission, however, was emphatically opposed to a national flood control policy, asserting that there existed no national interest in flood prevention which would warrant government expenditure for this purpose. Furthermore, such a policy

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10. 36 Stat. 933.
11. See the Final Report of the National Waterways Commission, Sen. Doc. 469, 62d Cong., 2d sess.
12. See the Congressional Record, Vol. 51, Part 5, p. 5188.

was deemed unconstitutional.

> "The Federal Government has no constitutional authority to engage in works intended primarily for flood prevention or power development. Its activities are limited to the control and promotion of navigation and works incident thereto. The commission is of the opinion that flood prevention is primarily a local problem, and the work of controlling floods should in the first instance be undertaken by the minor political subdivisions, but that the Federal Government may very properly participate with the localities in carrying out such works on navigable streams, where a substantial and necessary improvement to navigation will result. Unless some such policy as this is adopted and adhered to, there is grave danger that the Federal Government may go outside its proper jurisdiction and become involved in enormous expenditures which are for local benefit. It has sometimes been urged that the Federal Government should undertake works for flood prevention on nonnavigable streams which happen to cross a State boundary line. It is clear that in such a case, if navigation is not concerned, the Federal Government should have nothing to do with flood prevention. A method is provided in the Constitution by which the States may cooperate for this purpose."[13]

A flood of the lower Mississippi in 1912 and the Ohio in 1913 brought the problem of Federal responsibility for flood control squarely before Congress. An emergency appropriation of $650,000 was made during the spring of 1912 to assist the local districts in maintaining their levees,[14] and the omnibus bill of that year alloted approximately $4,000,000 for the reconstruction of levees,[15] with the provision that such assistance should be considered as "extraordinary emergency work". Regardless of the emergency aspects of these appropriations, consternation was expressed in the House about this item when the bill was debated on the floor. Representative Humphrey expressed the opinion that such act constituted a new policy on the part of the Federal Government, which meant that the Government was entering into partnership with the

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13. Ibid., p. 27.
14. 37 Stat. 631, 37 Stat. 85.
15. 37 Stat. 201, 37 Stat. 633.

local authorities in the construction of levees and would lead to pressure from all parts of the country for flood protection. Representative Ransdall of Louisiana met this charge with the argument that (1) the Mississippi was a national problem because of its great drainage area and the number of States and people affected by its floods; (2) the States unaided could not cope with the problem; and (3) the lower Mississippi was the exception to the rule that the Federal Government would not assume responsibility for control of floods.[16]

In the spring of 1913 there was a disastrous flood on the Ohio River which wrought heavy damages in the States of Ohio and Indiana. At the request of President Wilson, the Secretaries of War, Interior and Agriculture, with the assistance of the National Drainage Congress, drew up a flood control bill, providing for the establishment of a flood protection and drainage fund to be administered by the Secretary of the Interior as an extension of reclamation activities.[17] The expenses of the undertakings were to be borne ultimately, however, by the owners of the land of the property benefited. The bill did not have the support of the Committee on

16. "The general idea of Congress, as far as I have been able to ascertain, in legislating in regard to that river was that from the vicinity of Cairo downward a very unusual state of affairs existed. . . . It was thought that the vast accumulation of waters from Cairo down made an abnormal condition of affairs, one entirely different from that existing in any other section of the country. Whether or not this has been a wise principle to adopt I am not prepared to say, but it has been the policy of this government for the past thirty years.

Whether that policy will extent to other rivers remain for future Congresses to pass upon. . . . Heretofore, however, this has been considered the one great exception which proves the rule, and Congress has not been appropriating for levees at any other point in this country, so far as I know, except on the Mississippi River." (Congressional Record, Vol. 48, Part 9, p. 9334.)

17. H. R. 8189, 63d Cong., 1st sess.

Rivers and Harbors and was, consequently, not reported back to the House. Congress did, however, appoint a board of Army officers, known as the Ohio Valley Flood Board, to report upon the most practical and effective measures for prevention of damage by floods in the Ohio Valley. In transmitting the report of this board to Congress, the flood control problem was stated by the Secretary of War as follows:

> "The subject of flood prevention and protection is one of great national import, and it is imperative that steps be taken to ameliorate conditions in the worst afflicted districts in the various parts of the United States without unnecessary delay.
>
> The interests of navigation and interstate commerce demand that the Federal government seek a remedy and join with local interests in applying it. Economical and efficient cooperation on the part of the local interests is extremely difficult to attain unless the Federal government lends its unifying and guiding power. . . . . The War Department should be empowered to pass upon plans evolved by various of the communities, with a view to insuring that they do not conflict with a general plan of flood protection for the entire district to the detriment of navigation and other interests; but it is my belief that the Federal government should go further, and that to accomplish the best results it should undertake to prepare general plans of flood prevention and protection, to pass upon and coordinate plans prepared by the various communities, to arrange for a fair and proper distribution of the cost of execution of such plans, and the portion of the work to be accomplished by each of the interested parties. The portion of the expense of the undertaking which should be borne by the Federal government should be the value of the protection rendered to navigation, to interstate commerce, and other Federal interests."[18]

In the interests of navigation, the Flood Board found that the United States was not justified "in cooperating with the States or other communities or interests in devising and carrying out plans for flood protection of these streams."[19] It was recommended, however, that the Federal Government should make all the necessary

18. Report of the Ohio Valley Flood Board, H. Doc. 914, 63d Cong., 2d sess.
19. Report of the Ohio Valley Flood Board, H. Doc. 1792, 64th Cong., 2d sess., p. 2.

surveys to draw up the plans for control, that the jurisdiction of the War Department should be extended to include non-navigable streams as a preliminary step in a proper plan for national flood control, and that such control should be based on the certain and positive benefits that accrue in the protection of life and property and the protection of commerce rather than in the uncertain benefits which may accrue to navigation.

In spite of the increase of interest in the problem of flood control during the period from 1900 to 1916, there was no change of policy. In 1916, Representative Chipperfield stated in the House that the problem of flood control "is still as near unsolved as it was at the day when the first President of the United States raised his hand to be inaugerated."[20] For years the Presidents of the United States and the two major parties definitely asserted themselves in favor of a program of flood control, yet nothing was done outside of contributing to the building of levees on the Mississippi and making appropriations after major flood disasters to relieve those who had suffered. Appropriations for flood control were still made in the name of navigation and allotments by the Mississippi River Commission were made with respect to localities. No uniform plan, based on sound engineering data, had ever been formulated, and the construction of levees rested primarily with the local levee districts which were powerful political agencies. No thorough study was ever made of the river to secure the necessary data to devise a proper plan of control. The Commission was always handicapped by lack of sufficient funds and allotments were made to the local levee

20. Congressional Record, Vol. 39, Part 2, p. 2079.
21. See the article by Arthur E. Morgan, "A Policy for the Mississippi", Annals of the American Academy, Vol. 135, p. 50.

districts wherever the need was the greatest.[22] No policy had been formulated as to local contribution. Colonel Townsend testified in 1913 that the system was a "happy-go-lucky method of business", whereby the Federal Government had borne the entire cost of flood protection in some localities and in other localities the levee districts had done the greater part of the work.[23]

Money raised by taxes by the levee districts was often spent for the payment of political debts instead of the building of levees. Funds were wasted because contractors received the work on favoretism, rather than on merit. Certain influential planters in the district would insist that the levee be built near the river's edge in order to protect their property, even though that would put the levee near a caving bank where it would soon be destroyed by the water. These, and other similar practices, had further prevented the adoption and prosecution of a systematic and uniform plan for flood control of the Mississippi.

Development of Flood Control Policy, 1916 - 1928.

After many years of granting appropriations for flood control to the levee districts in the name of navigation, a motion was made in the House in 1916 that a new committee be created -- a Committee on Flood Control. The problem of committee jurisdiction had been a complexing one. As stated by Representative Chipperfield, "flood control has been made a game of battledore and shuttlecock between

22. Federal assistance was confined to the levee districts. No aid was given to municipalities because of lack of funds. See the hearings on the Mississippi River at Memphis, House Committee on Rivers and Harbors, 63d Congress; and the hearings on Mississippi River Levees at Columbus and Hickman, Kentucky, House Committee, 63d Congress.
23. See the hearings on Mississippi River Levees, before the House Committee, 62d Congress.

the committees of the House, one saying that it did not have jurisdiction, and jurisdiction being denied to another."[24] As long as the problem of flood control could not be considered on its own merits as a problem primarily of protecting property, there could be no formulation of a uniform plan, either on the Mississippi or other rivers in the country, or a national policy as to division of responsibility and costs in flood control undertakings. The extent to which the problem of flood control was being recognized as one necessitating Federal consideration is apparent from the debate on the appointment of this new, permanent standing committee. The reason for taking jurisdiction away from the Committee on Rivers and Harbors and creating this special committee on flood control was given as the "realization of the fact that there are aspects of the question of flood control which are not related to either navigation or commerce."[25] There is no evidence from the debate, however, that it was the intention of the House to introduce a national flood control policy which would involve Federal participation in flood control undertakings whenever there were need for such within the country. The principal purpose in creating the committee was, apparently, for the formulation of a definite and uniform plan for handling the flood problem in the lower Mississippi Valley.

In the following session of Congress a bill was introduced for the control of floods on the Mississippi and Sacramento Rivers, which was known as the Ransdell-Humphreys bill.[26] The essential

24. Congressional Record, Vol. 53, Part 2, p. 2079.
25. Ibid., p. 2069.
26. H. R. 14777, 64th Cong., 1st sess.

provisions of this bill were as follows:

1) An appropriation of $45,000,000 was authorized for flood control on the lower Mississippi, but not more than $10,000,000 should be expended during any one fiscal year.

2) Local interests were required to contribute one-third of the cost of levee construction, the necessary rights of way for levees, and assume all responsibility for maintenance and repair upon completion of the levee system.[27]

3) Any surveys of flood conditions on other streams desired by the Committee on Flood Control should be made by the Board of Engineers on Rivers and Harbors.[28]

4) An appropriation of $5,600,000 was auth orized for the Sacramento River project, of which not more than $1,000,000 should be spent in any one year. The problem of flood control on the Sacramento was closely connected with improvement of the river for navigation and reclamation. The California Debris Commission had recommended that private interests take care of the reclamation aspects of the problem, that the Federal Government pay one-half of the cost attributable to navigation improvement, and that the remainder be paid by the State of California.[29] Upon completion of the flood control works, they were to be turned over to the State for maintenance.

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27. Maintenance was given a general construction by the Commission to mean replacement as well as repair.

28. All such surveys and examinations were to include (a) extent and character of the area to be affected by the proposed improvement; (b) the probable effect upon a navigable water or waterway; (c) the possible economical development and utilization of water power; and (d) such other uses as may be related to or coordinated with the project. The Board shall also indicate the Federal interest in the project, the share of the expense which should be borne by the United States, and the advisability of adopting the project. Surveys for flood control were later included in the 308 Reports.

The Mississippi River Levee Association sent a large body to Washington to put the bill through Congress. Four special trainloads were sent to the capital to be present at the hearings. The bill passed the House with no difficulty but met with some opposition in the Senate. Objection was made to the fact that in the process of eliminating suffering in the Mississippi Valley, which had the full support of Congress, certain large landowners would receive substantial benefits. There was a general understanding that much of the overflow land in the flood area had been purchased by syndicates at a very nominal price. Adequate flood protection would, of course, greatly enhance the price of this land. This introduces one of the serious problems of flood control. Careful consideration should be given to the advisability of protecting overflow lands for once the policy of control is inaugerated, vested interests are created which will demand continuation of the policy. If responsibility for flood control is to be assumed by the Federal Government, it would seem advisable that the Government also have control over the use of bottom lands.[30]

Senator Kenyon proposed that the levee districts be required to pay half of the cost of levee construction and offered an amendment to this effect, but it was defeated by a vote of thirty-two to twenty. Objection was also made by Senator Newlands, who again opposed the piecemeal policy with regard to waterways, of which flood control and the bill in question were but a part. He looked upon this bill as a spoils system measure which was introduced by

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29. Report on the Sacramento River, H. Doc. 81, 62d Cong., 1st sess.
30. See the recommendations of the Board of Engineers in the Ohio River report, H. Doc. 306, 74th Cong., 1st sess.

the owners of large areas of swamp land along the Mississippi which they desired to reclaim. Again Senator Newlands emphasized the necessity of considering all uses of waterways and coordinating them in one comprehensive plan, and expressed the hope of seeing Congress develop a great national system which would embrace every watershed in the country. To this end, he offered an amendment to the flood control bill providing for a waterways commission to study and develop plans for the comprehensive development of waterways.[31] There was fear expressed in the Senate that the adoption of the Newlands amendment would result in the defeat of the bill in the House. It was rejected, consequently, by a thirty-two to twenty-nine vote and the bill was passed without amendment.[32] The extent to which the ideas of Senator Newlands for comprehensive planning was gaining favor in the Senate, however, is evidenced by the statement of Senator Walsh upon the rejectment of the amendment.

> "It was the opinion of many of us that the general principles at least of the amendment tendered by the Senator from Nevada ought to find a place in the bill. I am satisfied that the ideas advanced by the Senator will take hold eventually upon the people of the country, and he is entitled to very great credit for his persistency in keeping it before the Senate."[33]

The jurisdiction of the Mississippi River Commission was extended in 1923 to include the tributaries, insofar as they were affected by the flood waters of the Mississippi. This allowed the Commission to expend part of its appropriation for the river on the various tributaries. In the same year, the act of 1917 was extended for another six years.[34]

31. The factors to be considered by this Commission were the same as those indicated in previous bills introduced by Senator Newlands. See Appendix A for details of these bills.
32. 39 Stat. 948.
33. Congressional Record, Vol. 54, Part 5, p. 4296.
34. 42 Stat. 1505.

Throughout the entire period from 1917 to 1928 there continued to be dissatisfaction with the method of controlling the Mississippi. The size of the appropriations had been increased by the acts of 1917 and 1923, but the method of allotting funds by the Commission was unchanged except for the requirement that local levee districts must contribute a certain definite proportion of the cost of constructing the levees. No comprehensive examination was made of the river and its tributaries to devise a uniform and complete plan of control.[35]

After the appointment of the flood control committee and the passage of the flood control act, a number of bills were introduced into the House to extend the activities of the Federal Government to other streams. The increase in bills providing for flood control on various streams and a definition of national flood control policy are evidence of the continued increase of interest in the problem, and the belief that it was of sufficient national interest to require Federal attention. Federal participation in flood control undertakings was not extended, however, and the policy for future activity was not defined.[36]

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35. An interstate commission was created by the States of Oklahoma, Texas, New Mexico, Arkansas, Louisiana, Colorado and Kansas, with the object of conserving the waters, controlling floods and improving the Arkansas, Red and White Rivers and their tributary streams. This commission made a thorough study of the rivers in question and drew up plans for a complete reservoir system at an estimated cost of $105,000,000. No action was taken, however, either by the States or the Federal Government to carry out such an undertaking.

36. For the attitude of the Board of Engineers for Rivers and Harbors toward the problem of flood control, and Federal responsibility with respect thereto, see the reports on the San Antonio River, H. Doc. 522, 66th Cong., 2d sess.; the Red River, H. Doc. 848, 65th Cong., 2d sess., and H. Doc. 381, 69th Cong., 1st sess.; the Caloosahatchee River and Lake Okeechobee, H. Doc. 215, 70th Cong., 1st sess.; and the Pond River, H. Doc. 377, 69th Cong., 1st sess.

The Flood Control Act of 1928.

In the spring of 1927 the whole subject of the proper control of the Mississippi River and of national interest in flood control was forcibly brought before the people of the country by the occurrence of the greatest flood of the lower Mississippi ever recorded in history. Serious breaks occurred in the levees in 145 places and nearly 30,000 square miles of land was inundated. The direct property damage in five states was estimated at $236,000,000, and the indirect damage at $200,000,000. There was an immediate demand for adequate flood control, not only from the afflicted area, but from the entire Nation, and the President was criticized for not calling an extra session of Congress to make immediate provision for the problem, to take steps to avoid all such disasters in the future. Hearings were held by the House Committee on Flood Control from November 7, 1927 until January 26, 1928. Over three hundred witnesses were examined and the published hearings comprise eight volumes. More than five thousand letters and telegrams from all over the United States were received by the committee, as well as some three hundred manuscripts containing flood control plans. There is a vast amount of information contained in these hearings, including opinions as to the proper method of flood control, the basis of national interest in the Mississippi floods, the legal aspects of the problem, the activities of the Mississippi River Commission and the levee districts, the engineering aspects of the problem, and the need for a national flood control policy.

The principal aspects of the problem which had to be decided by Congress before the enactment of any legislation were, (1) to what extent should the local interests contribute to the cost of

providing adequate control; (2) what agency should administer the plan; and (3) to what extent should other uses of water be considered in the plan for controlling floods.

Local contribution.

In the report submitted by the Mississippi River Commission, it was recommended that the same proportion of cost be borne by the interested localities as established in the act of 1917 with the exception of the maintenance provision. The experience of the ten years following the act of 1917 indicated that proper maintenance and repair of levees could be secured only by continued Federal operation. The Commission, therefore, recommended that the Government continue to maintain, repair and replace levees. The plan of the Army Engineers, commonly known as the Jadwin plan, agreed that the local districts or States should provide all necessary land and assume all damages, both of which were large items inasmuch as the plan submitted by both of these agencies provided for floodways. The Army Commission recommended that the United States bear eighty per cent of the cost of levee construction and control works in general.[37] Local contribution to the extent of twenty per cent was considered desirable not only because of the local benefits conferred by adequate flood control, but also because local participation furthered the interest of the localities in the proper execution of the work and afforded a check on the pressure for works not economically justified.

In the message of President Coolidge to Congress transmitting the report of the Army Engineers and their plan for flood control

37. See report on the Mississippi River Floods, H. Doc. 90, 70th Cong., 1st sess.

of the Mississippi, the President stated:

> "In determining the distribution of the costs, there must be considered not only the people of the valley itself, who receive the major portion of the benefits, but also the great masses of taxpayers who suffer less directly from Mississippi River floods and upon whom the burden of Federal taxation falls. It is axiomatic that State and local authorities should supply all land and assume all pecuniary responsibility for damages that may result from the execution of the project. It would be revolutionary for the Federal Government to establish the precedent of buying part of the land upon which to build protection works to increase the value of the remainder."[38]

The argument over local contribution was the primary factor in delaying legislation. The congressional representatives of the Mississippi valley states advocated the full assumption of cost by the Federal Government. Most of the witnesses at the hearings, including representatives from such organizations as the National Chamber of Commerce, farm bureaus and organizations, the American Legion, the Mississippi Valley Flood Association, the Chicago Flood Control Conference, the American Railway Engineering Association, and the American Federation of Labor, as well as the congressmen from the states affected and the inhabitants of the valley, maintained that there was a sufficient national interest in the problem to justify Federal assumption of all costs. The principal reasons offered by these witnesses were as follows:

a) The general welfare.

Governor Small of Illinois, one of the first witnesses at the hearings before the House committee, stated that "this problem is a proper subject for governmental attention because of the established economic fact that any preventable calamity which injuriously affects the welfare and prosperity of the people of any considerable portion of the country cannot fail to have a detri-

38. Ibid., p. 2.

mental effect upon the rest of the country."[39] This argument was offered, in one form or another, by many witnesses.

b) Interruption of interstate and foreign commerce.

Inasmuch as one of the accepted duties of the Federal Government is to protect and encourage interstate and foreign commerce, any measure of flood control would be in the interests of commerce. There is no question, of course, but that the flooding of railroads and highways and the destruction of bridges seriously interferes with commerce. Furthermore, by destroying crops and property, a large amount of commerce which would have resulted from the sale of products and crops and the purchase of goods from other parts of the country is destroyed. The movement of the mails, and the protection thereof by the Federal Government, is closely allied to this matter of interstate commerce. The improvement of the Mississippi River for purposes of navigation and the relation of floods to navigation is a specific aspect of the national interest in interstate commerce.

c) Federal control of the river.

Inasmuch as the Federal Government had assumed control over the river, it was argued that it should also assume all responsibility for the river. This argument was stated by Senator Hawes (of Missouri) before the Senate Committee on Commerce as follows:

> "I would like to have these gentlemen understand that we cannot put a boat on the river without the permission of the United States Government. We cannot build a dock without that permission, or a dam, or a bridge, or a wharf; that the United States Government has taken complete charge, control, and direction over everything pertaining to the Mississippi River and its navigable tributaries. I cannot run a boat with five men in it and a

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39. Hearings on Flood Control, before the House Flood Control Committee, 70th Cong., 1st sess., p. 8.

> motor back of it, without the permission of the United States Government today. You cannot put a pipe-line underneath the water or a transmission line above the water without the consent of the Government.
>
> The River belongs to the Government, and as long as the United States exercised control over the river for the good that is in it, it should also exercise control for the harm that is in it."[40]

d) Scope of the problem.

The inhabitants of the Valley insisted that they were not responsible for the floods, that the source and cause of the flood waters were far removed from the flood area. The problem was, consequently, a national one which should be controlled by the Federal Government and paid for by Federal funds. Mr. Dufour, a member of the New Orleans flood policy committee, stated that the inhabitants of the lower Mississippi Valley had been "victims of man's inhumanity to man", meaning that the cultivation of farms, the drainage of land, and the industrial and urban development throughout the States in the drainage area had greatly increased the flood menace in the lower valley.

Other arguments offered to establish a national interest in the problem were the protection of life; national defense; the destruction of products essential to the Nation's great industries, such as cotton and sugar; and the devastation of the most fertile sections of the United States which, with proper development, would afford an extensive and valuable market for the products of other sections of the country. A rather unique argument was offered by Judge Little of Arkansas to the effect that the problem was a national one in a financial sense, in that the levee district bonds were held by various institutions and individuals throughout the entire country.[41]

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40. Hearings on Flood Control before the Senate Committee on Commerce, 70th Cong., 1st sess., p. 59.
41. Ibid., p. 60.

Many of these arguments would, of course, apply with equal force to other rivers in the country. The danger of setting a precedent and opening the doors of Congress to large Federal expenditures for flood control projects was recognized by members of the committees handling the problem, and was one of the factors which delayed the formulation of policy with respect to the Mississippi River.

The establishment of a national interest in the problem of controlling the Mississippi floods was not considered a sufficient cause by members of Congress for the entire assumption of cost by the Federal Government. The advocates of local contribution had never denied the fact that the floods of the Mississippi affected the general welfare and that the problem was national in scope. Nevertheless, the local benefits resulting from flood protection were deemed sufficient to require local contribution. To strengthen the argument, therefore, that the Federal Government should bear the entire cost, other reasons were advanced by the local interests and their representatives, such as the need for a uniform policy of control, the past expenditures of the levee districts and the present financial condition of the localities concerned.

e) Past payments of the levee districts.

There was no question but that the levee districts had paid heavily for flood protection in the past. During the period from 1882 to 1927, the local organizations and the States had spent $167,011,455 as compared with the $71,089,993 which was spent by the Federal Government.[42] It was argued, therefore, that the Government had not paid its fair share of the cost in the past, and had permitted the levee districts to contribute all that they could

42. H. Doc. 90, 70th Cong., 1st sess., p. 10.

possibly raise by taxation and bond issues.

f) Uniform policy.

It was generally conceded by the witnesses at the hearings and during the debates in Congress that the previous policy had broken down. In order to have a uniform and complete policy for the control of the river, it must be under a centralized agency. But more than this, it must be paid for entirely by the Federal Government for, so the argument ran, if some localities were unable to contribute it would make no difference how much other localities contributed.

g) Capacity to pay.

Most of the proponents for complete Federal responsibility for the project offered the argument that many of the levee districts could not contribute because they were bankrupt. Special levee taxes had been placed on all the property and on all goods produced within the district. Moreover, these districts had issued all the bonds for which they could find a market. The Government would, therefore, have to pay all the costs of the project if it were to be undertaken, including therein not only the full cost of building levees and floodways but also to acquire the necessary lands and incur the damages to property.

Administration of the policy.

Much criticism had been directed toward the former administration of the levee policy by the Mississippi River Commission and the Army Engineers, and suggestions were offered for various changes in the administrative agency. The Jadwin plan advised that the Chief of Engineers be given the authority to plan and direct the work on the Mississippi River and that the president of the Commission re-

port directly to the Department of War. Some of the witnesses from the Mississippi Valley favored the Mississippi River Commission as the executive agency and suggested that it report directly to Congress. Others suggested the creation of a new commission, directly responsible to Congress.[43]

The Army Engineers were severely criticized for the past administration of the project. When the Secretary of War, Dwight F. Davis, urged caution in the formulation of a flood control policy for the Mississippi, advising that a plan should first be devised, Governor Pinchot declared that the worst enemy of the Corps could not have formulated a more destructive charge against its efficiency in the regulation of the river.

> "Unless my dates are wrong, the Corps of Engineers of the United States Army has had charge of the river since 1879. . . . From 1879 to 1927 is forty-eight years. Forty-eight years is practically half a century. At the end of the half century of control work by the army engineers comes the worst and most costly flood that we know anything about. And more than that, the Corps of Engineers, after half a century of acting and responsible dealing with this river, does not know what to do next, is without a plan for its control."[44]

Scope of the project.

The third difficulty in formulating a flood control policy was the scope of the project. The problem was whether the pending legislation should provide only for the immediate problem of protecting the lower Mississippi Valley from floods, or should it include a comprehensive plan for the Mississippi River and its tributaries, taking into consideration navigation, flood control, irrigation and water power. The witnesses from the lower valley maintained, of course, that Congress should be concerned only with the

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43. See the hearings before the Senate Committee on Commerce.
44. Pinchot, Gifford, "Mississippi River Floods", Survey, Vol. 58 (July 1, 1927), p. 367.

more immediate problem and insisted that the plan for control should be kept free from any entangling alliances with other uses of water. On the other hand, the representatives from the tributary states were very enthusiastic about a complete plan of development which would involve the construction of multiple purpose reservoirs. The reservoir system was much more expensive but would yield returns from power and irrigation. As stated by Senator Norris:

> "Tributary flood control will involve an immense expense, but it will be the only part of the whole thing that will bring in any return. If properly handled, it will bring in a big return, because the water that does damage down the Mississippi Valley will do a whole lot of good in some parts of the country where it can be used for irrigation, and those who use it will pay for it; and in other places power will be developed, and those who get the power will pay for it."[45]

Representative O'Conner of Louisiana had long been interested in the problem of comprehensive development of water resources, and had consistently maintained that the proper method of handling the Mississippi flood problem was to develop the river in its entirety. The representative from Louisiana introduced a bill into the House in 1927 which was modeled after the Newlands bills, providing for the creation of a waterways and water resources commission to coordinate all uses of water.[46] Similar bills were submitted by Representatives O'Conner and Rainey in Congress the following year but were not reported back to the House. Public opinion had not yet crystallized to the point of undertaking such a vast scheme. Lack of information, as to the engineering practicability and cost of a reservoir system; the possibility and desirability of irriga-

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45. Congressional Record, Vol. 69, Part 5, p. 5488.
46. H. R. 5025, 69th Cong., 1st sess. See Appendix C for the speech of Representative O'Conner with respect to this bill.
47. H. R. 5765, 5771, and 11889, 70th Cong., 1st sess.

tion in the territory near the tributary streams; and the cost of and demand for power; combined with the need for immediate relief in the lower Valley; prevented any serious consideration of comprehensive development of the Mississippi River system at that time. Considerable public interest was aroused, however, in the possibility of a planned, coordinated development of the Mississippi River system.

A large number of bills were introduced into Congress which embodied the various plans for flood control for the Mississippi Valley. After weeks of hearings, the House Committee on Flood Control reported out the Reid bill, which provided that the Federal Government should bear the entire cost of the project, including rights of way for levees and floodways, and also maintain the project after completion.[48] The membership of the Mississippi River Commission was to be increased and the project turned over to them for administration. No outline of the plan for control was given in the bill.

In the Senate Committee on Commerce, attention was given primarily to three bills: (1) the Jones bill which embodied the Jadwin plan;[49] (2) the Randdell bill which followed the Mississippi River Commission plan but provided that the Federal Government should bear the entire cost of the project;[50] and (3) the Hawes bill which provided that the Government should pay the entire cost and that a new commission should be created to take over all flood control problems connected with the Mississippi River and its tributaries.[51] After a consideration of these three bills, the

48. H. R. 8219, 70th Cong., 1st sess.
49. S. 1677, 70th Cong., 1st sess.
50. S. 1999, 70th Cong., 1st sess.
51. S. 819, 70th Cong., 1st sess.

Senate Committee drew up a new bill which waived local contributions, but recognized such an action as an exception to the fundamental principle of cooperation in accordance with the local benefits received.[52] Maintenance was to be provided by the local interests. The members of the House Committee who had opposed the Reid bill considered the Senate bill the lesser of two evils and it was, consequently, reported to the House.

When the bill was debated in the House and the Senate, all the controversial questions were again considered and arguments presented as to the concept of national interest, the financial condition of the levee districts, opinions as to local benefits, the efficacy of the reservoir system as opposed to the levee and spillway method, the inefficiency of the Army Engineers, the need for a new Commission, and the desirability of a comprehensive plan of development for the river system. The suggestion was offered to the House by several representatives that the localities and individuals benefited should pay according to their capacity.[53] Much of the land back of the levees was owned by large corporations and landowners. They had put up a big campaign for Federal assumption of the cost by sending lobbyists to Washington and advertising extensively. It was recommended, therefore, that these landowners who were able to pay should do so. As stated by Representative Kopp:

> " "When special benefits go to the owners of large estates there should be local contributions. Any other rule is unfair and unjust. Nobody has insisted that any

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52. S. 3740, 70th Cong., 1st sess.
53. As stated by Representative Snell of New York, "If this Commission reported back that such and such a community is not able to bear any part of the expense, well and good; if another community could pay five per cent, all right; if still another could pay one-third, we could act accordingly; this would cover the situation; and to my mind this is absolutely fair in every respect." (Congressional Record, Vol. 69, Part 6, p. 6841.)

arbitrary rule should be made as to local contribution. All we asked was that an economic survey should be made and that if these landowners were able to pay for the special benefits they received, a contribution should be required, and that if they could not pay for special benefits, that they should be relieved."[54]

Such a method of allocating costs would have been extremely difficult to administer. The suggestion made small headway, however, against the solid bloc of southern representatives. President Coolidge maintained his position that the local interests should contribute to the project and expressed his disapproval of the bills reported back to the House. Throughout the congressional debates on the bill, the President indicated that he would veto it unless the provisions for assumption of cost were changed. The veto threat was, however, ineffective and the bill was signed by the President in its original form. The act was carefully worded, though, to avoid setting precedent of complete Federal responsibility for flood control.

"It is hereby declared to be the sense of Congress that the principal of local contribution toward the cost of flood control work, which has been incorporated in all previous national legislation on the subject, is sound, as recognizing the special interest of the local population in its own protection, and as a means of preventing inordinate requests for unjustified items of work having no material national interest. As a full compliance with this principle in view of the great expenditure estimated at approximately $292,000,000, prior to May 15, 1928, made by the local interests in the alluvial valley of the Mississippi River for protection against the floods of that river; in view of the extent of national concern in the control of these floods in the interests of national prosperity, the flow of interstate commerce, and the movement of the United States mails; and, in view of the gigantic scale of the project, involving flood waters of a volume and flowing from a drainage area largely outside the States most affected, and far exceeding those of any other river in the United States, no local contribution to the project herein adopted is required."[55]

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54. Ibid., p. 6711.
55. 45 Stat. 534, sec. 2.

The States or local levee districts were required to provide rights of way for levees and to maintain the works after completion. Administration of the project was given to the Mississippi River Commission, under the direction of the Secretary of War and the supervision of the Chief of Engineers. An appropriation of $350,000,000 was authorized for the undertaking. As to the scope of the project, the act was a compromise between the need for immediate action in the lower valley and the demand for a comprehensive plan of development which would include control of the tributaries as well as the main stem. The adopted project applied only to the lower valley. Section ten of the act provided, however, for a complete survey of the river system, indicating the feasibility of a reservoir system on the tributaries, the various uses of water which could be combined with flood control, the cost of the undertaking and the prospective income from these other uses, and the benefits to accrue to navigation and agriculture from the prevention of soil erosion and siltage entering the stream.

Recent Development of Flood Control Policy

A few bills were passed after 1928 authorizing surveys of certain rivers and some attempts were made to secure Federal aid in flood control projects. The subject of a general flood control policy was not raised, however, until 1934, when the problem of the choice of projects for the relief of unemployment were under consideration. Only four flood control projects were adopted by the Public Works Administration; on the Rio Grande, the Muskingum (a tributary of the Ohio), the Tygart (a tributary of the Monongahela) and the Winooski Rivers. All of these projects had been favorably recommended by the Army Engineers. The first two are purely flood

works. The Muskingum project was undertaken in cooperation with the Muskingum Watershed Conservancy District. The Federal Government constructed fourteen reservoirs at a total approximate cost of $22,590,000; the Conservancy District provided all necessary rights of way and flowage rights at a cost approximately equal to the expenditure of the Federal Government. The Tygarts River project involves the construction of a dam and reservoir which is correlated with storage of water for purposes of navigation on the Monongahela River. The Winooski project is directly related to water power by a joint use of reservoirs.[56]

In order to make flood control projects eligible for funds appropriated to the Public Works Administration, a large number of bills were introduced during 1935 covering practically every river subject to floods in the United States. An omnibus bill was also introduced, which included projects in thirty-two states, taken primarily from the reports of the Army Engineers.[57] The bill required that the States or localities were to provide all land necessary for the construction of the projects and to maintain and operate all the works after completion. The bill came up for consideration very late in the session. It passed the House at ten o'clock at night on August 23, 1935, carrying total authorizations to the extent of $370,000,000. The passage of the bill by the House was characterized as a disgraceful exhibition of pork-barrel legislation by many of the representatives.[58] In one hour in the

56. See the report on the Winooski River, H. Doc. 785, 71st Cong., 3d sess.
57. For a list of projects included in the bill see the Congressional Record, Vol. 74, Part 13, p. 14153.
58. The bill was denounced in the House by Representative Rich as entirely pork barrel legislation. When reminded of the fact that he had, himself, proposed three of these projects (incidentally located in his own district), the representa-

Senate Commerce Committee the following morning an additional $200,000,000 was added. The opposition to the bill was led by Senator Tydings, who afforded the galleries considerable amusement by his satire and ridicule of various items in the bill as "delicious bits of 'pork chop' in this very fine 'piggish' bill."[59] The Senator was successful in forcing the bill back to the Senate Committee for reconsideration.

The following session of Congress again considered the subject of a general flood control policy and passed an omnibus bill on June 22, 1936, which authorized appropriations to the extent of $310,000,000 for a long list of projects, the choice of which was delegated to the President or his executive agencies. The basis for Federal activity in flood prevention is stated in the act as follows:

> "It is hereby recognized that destructive floods upon the rivers of the United States, upsetting orderly processes and causing loss of life and property, including the erosion of lands, and impairing and obstructing navigation, highways, railroads, and other channels of commerce between the States, constitute a menace to national welfare; that it is the sense of Congress that flood control on navigable waters or their tributaries is a proper function of the Federal Government. . . ; that investigations and improvements of rivers for flood control purposes are in the interest of the general welfare; that the Federal Government should improve or participate in the improvement of navigable waters or their tributaries for flood control purposes if the benefits to whomsoever they may accrue are in excess of the estimated costs, and if the lives and social security of the people are otherwise adversely affected."[60]

(Cont'd) tive from Pennsylvania replied that he "wanted to see how easy it was to get a project put into this bill. I made the request without any explanation at all, and these projects went through." (Ibid., p. 14153.)

59. Ibid., p. 14293.
60. 49 Stat. 1570, sec. 1.

As to the division of costs, it is provided that the local interests shall provide without cost to the United States all lands and rights of way necessary for the construction of the project, assume all damages due to the construction works, and maintain and operate all the works after completion in accordance with regulations prescribed by the Secretary of War. This act contemplates a wide extension of Federal responsibility for flood control throughout the country. No appropriations have been made under the act as yet, but some action in regard to flood control is expected from the present session of Congress. The extent and direction of Federal flood control activity will depend, in large measure, on the future public works program for water and land projects.

Summary.

For the past fifty years there has been a steady movement toward the establishment of Federal responsibility for the control of floods. With the steady growth of population, the reclamation and cultivation of overflow lands, the industrial development of the country, and the increasing specialization of the economic organization, the problem of floods and the consequent destruction of property, both private and public, and the interruption of the economic system, has assumed national proportions. The policy originated in 1882, in the name of navigation, with a small appropriation to assist local levee districts on the lower Mississippi to deal with the problem of floods. Since that time, complete responsibility has been assumed by the Federal Government for the flood problem of the lower Mississippi, and a national policy has been declared with reference to the problem of controlling the rivers throughout the country. Although many reasons have been offered to establish a

national interest in the problem and thereby justify Federal expenditures for flood control, the crux of the problem is simply that the Federal Government must take the initiative if the localities and States are unable or refuse to do so. The future of national flood control policy, the extent of national activities in this regard, and the problems of administration and allocation of costs of flood projects will depend on the future policy for the coordinated development of water resources by the Federal Government.

CHAPTER III.

FEDERAL IRRIGATION AND RECLAMATION POLICY

Growth of Interest in Irrigation

The arid and semi-arid regions of the United States extend from about the middle of the continent nearly to the Pacific coast, and comprise approximately two-fifths of the entire area of the country. The semi-arid region, which separates the distinctly arid and desert country from the eastern humid area, extends over North and South Dakota, western Nebraska and Kansas, into Oklahoma and the panhandle of Texas. By means of dry-farming, part of this area has been put into cultivation. In the strictly arid region, however, irrigation is absolutely essential and the available water, if entirely used for this purpose, could irrigate but a small part of the total area.

Irrigation of the arid lands of the West dates far back in our history. There are evidences of irrigation canals and distributing systems in the southern part of the region which had been built by the Indians. The first English-speaking people to settle in this area and cultivate by irrigation were the Mormans, who settled in the Great Salt Lake Valley in 1847. The success of this undertaking stimulated interest in the possibility of irrigating this desert land, and the methods and practices of the Mormans were adopted on later settlements. During the period from 1870 to 1880 several co-operative colonies settled in northeastern Colorado and were very successful in intensive farming by irrigation. Irrigation by private enterprise steadily increased during the last half of the nineteenth century. No accurate statistics are available, but it has been estimated that from a few thousand acres in 1850 there was a steady

increase to approximately 50,000 acres in 1860, and possibly 200,000 acres in 1870, followed by a rapid development, so that approximately 1,000,000 acres produced hay and cultivated crops in 1880.[1]

The first action of the Federal Government in regard to irrigation of arid lands was to encourage further settlement and development by private enterprise. The act of March 3, 1875, provided for the disposition of arid lands in Lassen County, California, termed in the act as "desert lands", to settlers who would irrigate them.[2] Two years later, in the so-called "desert land law" this policy was extended to the states of California, Oregon and Nevada and the territories of Washington, Idaho, Montana, Utah, Wyoming, Arizona, New Mexico and Dakota.[3] Desert land was defined as "all lands, exclusive of timber lands and mineral lands, which will not without irrigation, produce some agricultural crops." This act provided for the sale of not more than 640 acres, at $1.25 per acre, upon condition that the land would be irrigated. A period of three years was allowed in which to initiate settlement and irrigation of the land. In 1891 the act was extended to Colorado and was modified to permit two or more persons to acquire the land jointly, thus permitting and encouraging the formation of private irrigation companies under the act. The requirements for irrigation were made more severe.

In addition to encouraging private initiative in irrigation, the Federal Government also followed the policy of stimulating such activity by the States, which, as has been noted, was the first development of federal policy for river improvements and for flood

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1. The United States Reclamation Service, Service Monograph of the United States Government No. 2, Institute for Government Research, p. 3. This study is a valuable secondary source for the developments prior to 1902.
2. 18 Stat. 497.
3. 19 Stat. 377.

control. In 1894, by section 4 of the sundry civil appropriation act, commonly known as the Carey Act, the Government offered grants of land to any of the States containing arid land, not to exceed one million acres in each State, on the condition that such land be irrigated.[4] A period of ten years was allowed in which to commence irrigation and make claims to such land. In 1901 the terms of this act were extended so that it should remain in continued operation, allowing ten years for the reclamation of each body of land segregated thereunder. The results of this act were a disappointment to its sponsors and to the advocates of irrigation. During the first eight years of the operation of the act, seven States made application for approximately 1,200,000 of the available area of 7,000,000 acres. Of these, however, only one state, Wyoming, filed the proper proof of reclamation on 11,321 acres, which was the total area patented under the act by 1902. Small amounts of land were acquired from time to time under the Carey Act after 1902, but constituted a very small part of the available land. The reason generally given for this lack of interest and activity was that most of the projects had proven financial failures. In 1912 the Secretary of the Interior appointed a committee to investigate the conditions of the Carey Act project. The report of this committee attributed the failure of the projects and lack of development to improper administration of the act by the states and improper management by the promoters of the several projects. In particular the report criticized the segregation of lands for long periods of time at the request of promotors, the segregation of lands having insufficient water supply, the underestimation of the cost of irrigation works, the part of state officials

4. 28 Stat. 422.

in their supervision of the work of construction, improper methods of disposing of the lands, resulting in their appropriation by speculators rather than actual settlers, and the imposition of unduly burdensome water rates.[5]

During the period covered by this legislation to encourage individuals and the States to undertake irrigation projects, there was a continually increasing demand for direct treatment of the problem by the National Government by the construction of irrigation works on a large scale. This movement came from several different sources. In the first place, the original impetus of the movement probably came from Major Powell, who had received public attention and acclaim from his trip through the Grand Canyon. Major Powell had made extensive studies of the arid West and was very much interested in development of the country by irrigation. During the period from 1881 to 1894, as Director of the United States Geological Survey, he urged the enactment of legislation for the withdrawal of irrigable lands from public entry, and also direct Federal participation in the development of the land.

The National Irrigation Congress was a second factor in the movement for Federal action. The first meeting of the Congress was held in 1891 at Salt Lake City. The majority advocated that all irrigable lands be given to the States for development by private interests, but there was a strong sentiment among the minority in favor of national activity. When the Congress met for the second time in 1893, the need for federal direction wherever streams passed

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5. The United States Reclamation Service, op. cit., p. 7. This report was prepared by Herman Stabler, of the United States Geological Survey, P. R. Dudley, of the Land Office, and F. W. Hanna, of the United States Reclamation Service, and was printed as Sen. Doc. 1097, 62d Cong., 3d sess.

through several states was recognized. By 1894, at the third convention, the construction and maintenance of the irrigation projects by the Federal Government was expressly advocated. In 1899 the Congress was formed into a permanent organization.

In the third place, the disagreement between Major Powell and Congress as to the withdrawal of irrigable public land from entry and the proper course of action with regard thereto led to numerous committee hearings, special investigations, and debates in Congress. The publication and circulation of these hearings and reports played an important part in educating public opinion and arousing public interest in the problem.[6] The education of public opinion to any new Federal activity is generally a long difficult process, but it is the first requirement for any new legislation. The National Irrigation Congress did much in this regard by disseminating information concerning irrigation and enlisting public support. The movement for national construction and operation of irrigation projects was also furthered by the financial difficulties of private enterprisers, the failure of the Carey Act to lead to any extensive development, the numerous difficulties and law suits which arose among the several states and users of water over the diversion of water, and the attitude of the western states that the public lands therein or the proceeds from the sale of such land should be used for their benefit.

The first step in the direction of a national irrigation and reclamation policy was taken by Congress in 1888 by the passage of a

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6. The more important of these documents include the investigation and report of the Select Committee on Irrigation and Reclamation of Arid Lands, Sen. Report 928, 51st Cong., 1st sess.; the Report on Irrigation, 1893, Sen. Doc. 51, 52d Cong., 3d sess.; the report of Captain Hiram M. Chittenden, 1897, on reservoir sites, H. Doc. 141, 55th Cong., 2d sess., and the annual reports of the Geological Survey.

joint resolution directing the Geological Survey "to make an examination of that portion of the arid regions of the United States where agriculture is carried on by means of irrigation, as to the natural advantages for the storage of water for irrigation purposes, with the practicability of constructing reservoirs, together with the capacity of the streams and the cost of construction and capacity of reservoirs, and such other facts as bear on the question of storage of water for irrigating purposes. . ."[7] The following year the Senate Committee on Irrigation and Arid Lands was created. The resolution proposing the creation of this committee indicated that some type of Federal legislation on the subject was contemplated. The duty of the committee was stated to be "to consider the subject of irrigation and the best means of reclaiming the arid lands of the United States . . . and shall report to the Senate at the meeting of Congress in December next what legislation is necessary for such irrigation and reclamation."[8] The House Committee on Irrigation and Reclamation was appointed in 1890.

The Reclamation Act of 1902.

In 1900 Representative Newlands of Nevada introduced a number of bills for the establishment of Federal irrigation projects, all costs of construction to be borne by the United States and paid back over a period of years by the water users. The bills received wide attention and enactment was urged by the National Irrigation Congress, but no action was taken by the House during that session. In the message of President Roosevelt to Congress at the opening of the session in 1901, he presented the problem of reclamation in the

7. 25 Stat. 618.
8. Congressional Record, Vol. 20, Part 2, p. 1881.

West and the need for legislation by the national government. The national interest in irrigation and the general benefits which would result from a national reclamation policy are stated by President Roosevelt in this message as follows:

> "It is as right for the National Government to make the streams and rivers of the arid region useful by engineering works for water storage as to make useful the rivers and harbors of the humid region by engineering works of another kind. The storage of the floods in reservoirs at the headwaters of our rivers is but an enlargement of our present policy of river control, under which levees are built on the lower reaches of the same stream.
>
> The reclamation and settlement of arid lands will enrich every portion of our country, just as the settlement of the Ohio and Mississippi Valleys brought prosperity to the Atlantic States. The increased demand for manufactured articles will stimulate industrial production, while wider home markets and the trade of Asia will consume the larger food supplies and effectually prevent western competition with eastern agriculture. Indeed, the products of our irrigation will be consumed chiefly in upbuilding local centers of mining and other industries, which would not otherwise come into existence at all. Our people as a whole will profit, for successful homemaking is but another name for the upbuilding of the Nation."[9]

Of the series of bills introduced in this session of Congress, the House Committee concentrated attention on two -- the one introduced by Representative Newlands and the other by Representative Mondell. The essential features of the Newlands bill were as follows:[10]

1) Creation of a reclamation fund from the sale of public lands in arid and semi-arid states, with the exception of five per cent which was reserved for educational purposes by previous law.

2) The Secretary of the Interior shall use the fund for the construction of reclamation projects.

3) Upon completion, total cost shall be ascertained and

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9. Congressional Record, Vol. 70, Part 1, p. 221.
10. H. R. 13846, 56th Cong., 2d sess.

divided pro rata per acre to be irrigated.

4) Public notice shall be given to open lands under the homestead act. The settlers shall pay the cost of construction in ten equal payments plus charges for operation and maintenance.

5) Eighty acres of land shall be the limit for any one settler, or less, at the discretion of the Secretary.

6) Water shall also be available to land in private ownership in the irrigation project at the same rate, to the extent of eighty acres per person.

The Mondell bill was much broader in scope, much more in line with the ideas expressed by President Roosevelt in his message to Congress. This bill provided for the storage of flood waters and the construction of main canals to make the water available for irrigation purposes. The money for these projects was to be appropriated from the general treasury.

The Newlands bill was a compromise between the demand for conservation of water for purposes of irrigation and the objections to the expenditure of Federal funds for this purpose from the Eastern representatives. The proposed policy of Federal reclamation was branded at the hearings before the House Committee as "socialistic" and "discrimination" in favor of certain private landowners. Furthermore, the fear was expressed that the eastern business interests would be taxed to develop the west. Because of these objections, the Newlands bill provided that the fund should come from the sale of public lands in the Western states -- which the western representatives declared rightfully belonged to them -- and the costs should ultimately be repaid. The advocates of a national reclamation policy considered this bill merely the first step in

that direction and expressed their belief at the hearings that when the great national benefits of reclamation were demonstrated, by inducing settlers to build up a prosperous West, whereby Eastern manufacturers would benefit by increased demand for their products, more comprehensive legislation would be passed to provide for storage and conservation of water at national expense.[11] With the united efforts of the western representatives and the approval of the President the bill was passed on June 17, 1902.[12]

It is doubtful whether any act passed prior to this date had granted such broad discretionary powers to an administrative officer. The choice of projects, the expenditure of the reclamation fund, the privilege of eminent domain, the size of the farm unit, the determination of the water-right charges, and the extent of inclusion of private lands in Federal projects, were all entrusted to the Secretary of the Interior. Upon repayment of the greater part of the cost of construction, the management and operation of the irrigation works were to pass to the owners of the land irrigated thereby, to be maintained at their expense under the direction of the Secretary of the Interior. The title to the reservoirs and irrigation works would, however, remain with the Government. The only restrictions placed upon the Secretary were that he should, insofar as possible, spend the major portion of the funds from the sale of public lands in each State within the boundaries of that State; and that the total construction cost should be completely repaid in ten annual installments. Later developments proved that the first restriction was very unfortunate, and the second was ineffective.

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11. Hearings before the House Committee on Irrigation of Arid Lands, 56th Cong., 2d sess.
12. 32 Stat. 388.

The constitutionality of the act was questioned on a number of occasions on the ground that it was an unconstitutional delegation of power, that it authorized the expenditure of public money without appropriation, and that there was no constitutional authority for the inclusion of privately owned lands in the Federal projects. These questions were all decided in favor of the Government.[13]

Administration of the Reclamation Act, 1902-1924

After the passage of the Reclamation Act, the Secretary of the Interior, Ethan Allen Hitchcock, ordered the creation of the Reclamation Service, which was put under the jurisdiction of the Geological Survey. The staff of the new organization was composed largely of men who had made the surveys of the arid lands for the Survey. These studies served as the basis for the adoption of projects by the Reclamation Service. Frederick Haynes Newell, who had been connected with the Geological Survey and played an important part in the composition and enactment of the Newlands bill, was appointed head of the service. In 1907 the service was changed to an independent bureau, subject only to the control of the Secretary of the Interior.

Adoption of projects.

After the organization of the Service, no time was lost in the authorization of projects. Within a year after the passage of the act, construction had been started on four projects.[14] During the period from 1903 to 1907, twenty-four projects were adopted and under construction. See Table I for the list of these projects and the year in which they were authorized. The selection of projects

13. U. S. v. Hanson, 167 Fed. 881; Burley v. U. S., 179 U. S. 1; Magruder v. Belle Fourche Valley Water Users' Association, 219 Fed. 72.

14. Salt River, Arizona; Milk River, Montana; North Platte, Colo., and Newlands, Nevada.

TABLE I.

Federal irrigation projects -- Date of authorization by Secretary.

State	Project	Year of authorization					
Arizona	Salt River	1903					
Arizona-California	Yuma		1904				
California	Orland					1907	
Colorado	Grand Valley						1912
"	Uncompahgre		1904				
Idaho	King Hill						1917
"	Minidoka		1904				
Idaho-Oregon	Boise			1905			
Kansas	Garden City[a]			1905			
Montana	Huntley			1905			
"	Milk River	1903					
"	Sun River				1906		
Montana-North Dakota	Lower Yellowstone		1904				
Nebraska-Wyoming	North Platte	1903					
Nevada	Newlands	1903					
New Mexico	Carlsbad				1906		
" "	Hondo[a]		1904				
New Mexico-Texas	Rio Grande			1905			
North Dakota	Williston[a]				1906		
Oregon	Umatilla			1905			
Oregon-California	Klamath			1905			
South Dakota	Belle Fourche		1904				
Utah	Strawberry Valley			1905			
Washington	Okanogan			1905			
"	Yakima			1905			
Wyoming	Riverton						1917
Wyoming-Montana	Shoshone		1904				
		4	7	9	3	1	3

[a] Abandoned at later date

Source: Federal Reclamation by Irrigation, Sen. Doc. 92, 68th Cong., 1st sess., p. 43.

was made by the Secretary of the Interior with the advice and assistance of President Roosevelt. It is evident from this list of authorized projects that the Secretary attempted to meet the requirements of the act that the moneys derived from the sale of public lands should be spent in the respective States in the proportion contributed from land sales to the reclamation fund. During this five year period projects were authorized in every state indicated in the act with the sole exception of Oklahoma. The inclusion of such a provision in the organic law was most unfortunate. Demands were made by each state that projects be immediately undertaken. The fact that such political pressure was felt is evident from the following statement in the second annual report of the Reclamation Service:

> "The unfortunate condition exists that the States and Territories having the largest fund at present are those in which irrigation is of least importance and value. There the chief concern is not so much in reclamation as it is in having the funds spent in the State to promote general prosperity and improve business conditions. On the other hand, the States and Territories having the smallest fund have greatest need and possibilities of development and widest opportunities of making prosperous, self-supporting homes." (p. 34.)

As a result of this provision, a large number of projects were authorized and construction commenced immediately. The receipts into the reclamation fund would not be sufficient for the completion of all the projects for many years.[15] The same piecemeal policy, consequently, which had characterized the policy of improving rivers and harbors, was adopted by the Reclamation Service because the choice of projects had been opened to political pressure. The information on the basis of which these projects were chosen was con-

15. An advance of $20,000,000 was made in 1910 to aid in completing construction. (36 Stat. 835.) Repayment at the rate of $1,000,000 annually was commenced in 1920.

fined almost entirely to the determination of river flow and possible storage basins. No investigations had been made of soils or climatic conditions to determine the types of crops which might be produced. There was, consequently, no reliable knowledge of the income producing possibilities of the project, of the area which could profitably be cultivated, or the number of acres over which the cost of construction could be distributed. Furthermore, inasmuch as the policy of government aid and operation of the reclamation projects was in the experimental stage, the completion and operation of one or two projects would have supplied valuable experience. The immediate adoption of twenty-four gave no opportunity for the use of the accumulation of knowledge by experience in later projects. Many of the later difficulties of the Service can be traced back to this hasty choice of a large number of projects.[16]

In 1914, under the Reclamation Extension Act, Congress assumed complete control over the reclamation fund.[17] The Secretary of the Interior was required to submit annual estimates "of the amount of money necessary to be expended for carrying out the purposes authorized by the reclamation law, including the extension and completion of existing projects and units thereof and the construction of new projects." From that time on, annual appropriations have been made by Congress from the reclamation fund to meet the needs of the Bureau, and all new projects have required the specific authorization of Congress.

16. The provision of the act for proportionate expenditures was repealed in 1910. (36 Stat. 836), and the direct order of the President was necessary for the authorization of any additional projects.
17. 38 Stat. 689.

In the 1910 annual report the Secretary of the Interior requested legislation authorizing the sale of surplus water to persons or corporations operating systems for the delivery of water to individual water users for irrigation of arid lands. The private irrigation organizations in the same vicinity or drainage basin as these government projects wished to purchase additional water for they could not afford to provide storage. Dependence on the unregulated flow of the river was unsatisfactory for it commonly fell below the irrigation needs of the district. To meet these demands, Congress passed the Warren Act in 1911.[18]

Settlement of the Federal projects.

When the Reclamation Act was passed, the proponents of such legislation apparently believed that the duties of the Federal Government would extend only to the construction of the diversion and storage dams and of the main canals, making the water available to the area to be irrigated. Once the engineering problems were solved, the responsibility of the Government for the project would cease and its activities be confined to a general supervisory and administrative capacity until the major part of the construction costs were paid, at which time the project would be turned over to the water users' association. In other words, the operation of the project was conceived to be largely automatic upon the completion of construction. It was anticipated that farmers would soon take up all the available land, crops would be produced, and regular payments made on the construction and maintenance costs, all payments for construction to be completed within a ten year period.

18. 36 Stat. 925. The official title of the act is "The Disposition of Surplus Water and Cooperation in Irrigation Works." It is popularly known as the Warren Act, being so named for Senator Francis E. Warren of Wyoming.

Unfortunately, none of these anticipations were realized, and the proper settlement of the projects has been the most complexing and difficult problem which has confronted the Bureau. The first difficulty arose from the fact that the Bureau had no means or authority to prevent settlers from entering those lands which were to be part of a Federal project prior to the completion of construction or the availability of water. The Reclamation Act provided that the Secretary of the Interior, prior to or at the time of beginning surveys of any project, could withhold all lands believed to be susceptible of irrigation from the contemplated works, with the exception, however, that he could not withhold the lands from entry under the homestead act. Such entries could be made immediately.[19] As soon as a survey for a project was commenced, therefore, settlers flocked in and took up the lands. While waiting for completion of the project they resorted to dry-farming, which was generally unsuccessful and exhausted their capital which was necessary to put the farm in the proper condition for irrigation farming. Construction did not proceed as rapidly as they had expected and the water charges were invariably higher than they had anticipated. This all led to discontentment and criticism of the Reclamation Service. At the request of the Secretary, an act was finally passed in 1911 permitting the Service to withhold all public lands from entry until a division of a project was completed and the water available for irrigation.[20]

The second difficulty in regard to the settlement of the projects arose from the fact that some of the settlers made entry for the land with the expectation of making a profit by selling it

19. 32 Stat. 388, sec. 3.
20. 36 Stat. 836, sec. 5.

later when the project was completed and the value of the land increased thereby. This is, of course, an old story in the history of the public land policy. For many years after the establishment of the Reclamation Service, every annual report of the Secretary emphasized the serious consequences of speculation in project lands and urged the passage of effective legislation whereby such practices could be prevented. These settlers made no attempt to cultivate the land when the water was available, and they greatly exaggerated the value of the land. If successful in selling at a profit, the buyers were burdened with such a large original investment in the land that they could not pay the water charges. When these speculators could not sell at the price they wished, they continued to hold the land and either refused to farm or did so very inefficiently. The net result was that millions of dollars had been spent by the Federal Government for irrigating lands which were being withheld from cultivation. These uncultivated or very insufficiently cultivated areas cast discredit on the entire project, discouraged newcomers from settling in the district, and resulted in defaulted payments for the use of water.

The third problem of proper settlement of the project, which is closely akin to the second, was in regard to the lands within the project which were privately owned. When the reclamation act was passed, it was believed that it would apply mainly, if not wholly, to public lands. It was pointed out that there was at the time approximately 400,000,000 acres of public land and only an available water supply sufficient to irrigate some 40,000,000 acres. Upon investigation of the feasible projects, however, it was found that individuals and corporations had been very active in acquiring land

located along or adjacent to streams. The Engineers for the Reclamation Service soon discovered that any feasible project selected would necessarily include large tracts of privately owned lands. Moreover, the Department had to take into consideration the rights of settlers taking water from the stream in the vicinity of a proposed Federal project for reclaiming public land. These were generally absorbed into the Federal project, as the best solution to the problem of water rights and for the proper use of the available water supply.

When the surveys were made prior to the adoption of projects, there was an immediate demand from irrigation districts and private irrigation companies that they be taken over as Federal projects. Upon investigation, it was determined in many instances that the best lands and storage sites in the district had been selected by these individuals and private interests, but that the undertaking was too large for them and they were threatened with financial disaster. In such cases, it was deemed far more desirable to take over these projects, to enlarge or rehabilitate them, and to provide the necessary storage facilities, than to take poorer sites for the purpose of reclaiming public lands of an inferior quality. One of the first projects to be authorized, therefore, was on the Salt River, in Arizona, where a number of large private canals had been built and nearly all of the land was held in private ownership. Storage was needed to provide an adequate water supply. Eventually the project was completely reconstructed and greatly enlarged under Federal ownership and operation. A similar development took place on the Uncompahgre, Yakima, Rio Grande, North Platte, Boise and Newlands projects. Existing works were taken over, enlarged, ex-

tended, or entirely rebuilt. The Orland project was wholly on privately owned land, as were the Carlsbad, Strawberry Valley, and Okanagan projects. On all of the projects there was some land in private ownership. When the land irrigated under the Warren Act contracts is added to the privately owned land within the Federal projects, the seriousness of the problem of dealing with private landowners is apparent.

The Reclamation Act specifically stated that the Secretary of the Interior should determine the proper farm unit as an area sufficient to support one family. No individual could obtain a water supply for a larger area. Depending on the productivity of the land, the Department set the farm units generally at either forty or eighty acres. Under this policy of single holdings, those landowners who held extensive tracts of land within the irrigation project were required to sell their excess holdings in order to secure water rights for them. The owners were in no hurry to dispose of the land, however, preferring to hold it idle until they could secure a good price. The Reclamation Service attempted to compel the subdivision of these privately owned lands into the units fixed by law, but had no means of legally enforcing the policy. The result was that for many years large areas of the Federal projects were unsettled and uncultivated, being owned by non-residents or constituting excess holdings of settlers.

A still more serious problem resulted when these lands were sold to settlers at high prices. Before the initiation of the reclamation project, these lands were generally of little or no value. After their inclusion in the project, however, the owners capitalized the right to acquire water and sold at high speculative

profits. These sales were made on time and, as a rule, partial payments were to be made annually. The net result was that the farmers could not pay both the water charges and the high annual payment for the land, which led to the demand that they be relieved from the charge to the Government. As stated by the Reclamation Service:

> "The demand is that the huge speculative profit shall be first paid and that the reimbursement of the Government for the actual cost of the works should be postponed. This demand is fundamentally vicious and unjust. It not only diverts to private speculators the benefits of a great enterprise undertaken for the public benefit, but it inevitably postpones the day when the settlers are to take over the management of the works as is contemplated by the Reclamation Act, and it prevents the replenishment of the reclamation fund for the development of other projects. The public interest demands that the settlers should, as soon as consistent with the return of the government investment, assume responsibility for their own welfare and relieve the Federal Government from guardianship over them; also that the investment be returned at the earliest practicable moment and the benefits of the act be thus extended throughout the West with the utmost rapidity practicable. The postponement of payment therefore means local favoritism and large and frequent private profits at the expense of the general public."[21]

The fourth problem of settlement was the type of farmer who made entry for public land or purchased land from private owners. Many of them had no farming experience whatsoever, others were accustomed to the practices of dry-farming, or had been farmers in humid regions. They were generally unskilled in the arts of intensive agriculture as required on irrigation projects where the land must pay a heavy water right charge. In many instances, too much water was used and the land became waterlogged. In 1912, the Secretary of the Interior stated that many of the settlers "are wholly ignorant of country life in general and of arid conditions in particular. Pioneering on a reclamation project is still pioneering, requiring courage, energy and resolution to overcome its hardships."[22] The

21. Annual report of the Secretary of the Interior, 1912, p. 29.
22. Ibid., p. 26.

Government had not anticipated the need of educating settlers to the proper farming methods. Nor had any attempt been made by the Bureau to determine the proper crops to be produced on the projects; which necessitated experimentation on the part of the settlers and subsequent losses. After the engineering problems of construction were solved and the project was ready for operation, the project managers were faced with the far more difficult task of educating the farmers -- to induce them to cultivate their farms in the most profitable manner. The extent of this problem was indicated in the report of 1912 as follows:

> "It is commonly supposed that the difficulty of reclamation work is solved when water is had and the works are completed; on the contrary, this is only the beginning. Financial or technical questions of building shrink into insignificance compared with the more difficult human problem of dealing with thousands of settlers and of inducing them to take action along lines which will lead to their greatest individual success.
>
> The greatest present need of the projects is that of bringing to the reclaimed land the class of settlers who are competent to make use of its opportunities, and of encouraging or stimulating them to produce larger average crop values such as to justify the labor and cost of irrigation."[23]

In addition to the lack of experience in irrigation farming, there was a general lack of capital among the settlers. The first difficulty could be overcome by the industrious and intelligent settler, but the second could not. A considerable amount of capital was required to clear and level the ground and prepare it for crops, to build a house and the necessary farm buildings, to secure equipment, and to support a family in this preparatory period before any income was received. Few of the settlers had sufficient funds to adequately meet these purposes and, consequently, were in debt before any income could be received from their land.

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23. Ibid., p. 26.

Collection of charges.

The problem of the water-right charges has been a constant source of complaint from the settlers and of irritation to the Reclamation Service ever since the irrigation policy was initiated. The Reclamation Act had anticipated that all construction costs would be repaid in ten years, at the end of which time the project would be turned over to the settlers for operation, and that the reclamation fund and the attention of the Service would then be turned to other projects. Over thirty years has elapsed since water was delivered to the first projects, but the construction costs are still not fully repaid. There are many reasons for the delinquincy in payments. In many cases the construction costs were higher than originally estimated by the Service. In addition to building the reservoirs and main canals, the Government soon found that it would also have to build the distributing systems and provide necessary drainage works in order to induce settlers to take up the land, and to save the original investment in the project. Furthermore, the hasty choice of the twenty-four original projects had led to the inclusion of a larger area of land within the project, on the basis of which the original acre cost estimates were made than could be cultivated. Had the original survey included a thorough examination of the soils and climate, it would have been apparent that not all of the land included in the project could be used.

The lack of sufficient capital and experience in intensive farming prevented the settlers from properly developing their farms to realize the maximum potential income. The original expense of preparing the land for crops was greater than anticipated by the settlers, with the result that they were constantly in debt and

their land was not in a proper condition for cultivation. The lack of experience prevented many of the settlers from getting the best results from their farms and made the water charges appear excessive.

The existence of large uncultivated areas within the projects prevented the liquidation of the undertaking as originally anticipated. Most of this land was privately owned, and the Government had no means of forcing sales at reasonable prices. In 1916 the Secretary of the Interior suggested that the States cooperate with the Government and compel the landowners of non-resident and excess holdings to bear their just proportion of the cost of the irrigation works by means of taxation. The States, however, have consistently refused to assume any responsibilities for the successful development of the projects.

The price paid for the land was another cause of the financial difficulties of the settlers. Obviously, if the economic feasibility of the project were based on the assumption of cheap land, the settlers could not meet the water right charges after paying a price which capitalized on the existence of the irrigation works. When the Bureau investigated the causes for the water users complaints, it was found in many instances that the discontent had been stimulated by the large landholders, who insisted that they should be paid for the land before the water right charges were paid.

A final reason for the inability of some of the settlers to meet the construction charges was due to the policy adopted for the determination of the water right charges. The Act had stated that the construction charge should be determined per acre of land to be irrigated. The Bureau, accordingly, apportioned the total cost among the irrigable land within the project. No consideration was

given to the productivity or income producing capacity of the land. Furthermore, there was a great difference in acre construction costs among the various projects. Yet the time for repayment of construction costs was the same for all the projects. An investigation, made in 1924, to ascertain the reasons for defaulting payments found that the inequalities of cost relationship placed a handicap upon one group of water users which was not felt by another group, and attributed this factor as a real cause of difficulty on the Federal irrigation projects.

Because of these financial difficulties, which were felt to some extent on all the projects, a series of acts have been passed since 1910 to modify the requirements for repayment and to extent temporary relief to the settlers. In 1911 the Curtis Act was passed, which gave the Secretary of the Interior authority to withdraw any public notice previously issued and to modify any existing contracts with respect to projects under way before that time.[24] The effect of the act was to extend leniency and relief to those projects which were unable to meet their obligations. These was a temporary measure, however, and the settlers demanded that the reclamation act and the policy of the Reclamation Bureau as to payments be changed. Secretary Lane heard representatives from all the water users' associations in 1914. On the basis of his recommendations to Congress, the Reclamation Extension Act was passed, which extended the repayment period to twenty years with a graduated scale of payments which would give the settler an opportunity to develop his holdings before the commencement of water right charges.[25] The act

24. 36 Stat. 902.
25. 38 Stat. 686.

provided, however, that if an applicant were one year in default in the payment of any installment of the construction charge, or any part thereof, his water right application and, if an entryman, his homestead, should be subject to cancellation. All payments made prior to such cancellation would be forfeited to the reclamation fund. The act did not take into account the difference in acre costs and the varying productive capacities of the projects, or the different classes of land within the projects.

The drought period during 1917 and 1918 was a great stimulation to the Government reclamation projects. The success of the settlers on these projects brought many demands for the extension of existing projects and the construction of new ones. Many surveys were made for new projects, the costs of such investigations being paid by the Government, the States and voluntary associations. Fortunately, no new projects were adopted during the period for, notwithstanding the liberal terms of the extension act, the financial difficulties of the settlers were greatly increased in the period following the war. The post-war depression which brought a rapid decline in the prices of agricultural commodities made it impossible for the farmers on the projects to keep up their payments and led to a three-year moratorium under the so-called "leniency acts".[26] The financial difficulties of the settlers through this period led the Secretary of the Interior to place emphasis on the necessity of planning for the projects "to coordinate agricultural activities, to aid the farmers in raising better and more diversified crops, and in applying modern business methods in handling, marketing and realizing upon the crops produced, to effect economies wherever possible."[48]

26. 42 Stat. 4; 42 Stat. 489; 42 Stat. 1324.
27. Annual Report of the Secretary of the Interior, 1921, p. 59.

Administration of the projects.

As soon as the projects were opened for entry, the settlers were organized into a water users' association. It was through this organization that contracts and all arrangements were effected with the individual settlers and payments for the water rights were made. The formation of such an association was absolutely essential in all those projects which included private lands in order to give the Government a lien on the land as security for repayment of the construction charges. The reclamation act provided that the project should be turned over to the water users' association as soon as the major portion of the construction cost was repaid. In 1914, under the Extension Act, this requirement was repealed and the Secretary of the Interior was authorized to transfer the operation and maintenance of the project works to the association at his discretion.[28] Unfortunately, the settlers had come to rely on the Government and consider themselves as special wards. There was, consequently, no demand on their part for the control of the project.

Administration of the Reclamation Act after 1924

After several years moratorium, the Reclamation Service found the task of making collections, never an easy one, still more difficult. By 1924 the Federal Government had spent approximately $200,000,000 for reclamation projects. An additional $60,000,000 was required for completion of these projects. Repayment had amounted to nearly $18,100,000, or 9½% of the total cost. After twenty years experience with the settlers, the Bureau finally admitted that the financial independence of the projects seemed hopeless.

28. 38 Stat. 687, sec. 5.

The annual report of the Secretary of the Interior for 1924 stated that the Federal Reclamation Service had been completely demoralized and that drastic changes of policy were necessary. As a basis for recommendations to Congress with respect to such changes in policy, Secretary Work of the Interior Department appointed a special advisory committee to study reclamation and make a report to him.[29] This commission, commonly known as the Fact Finders' Commission, submitted its report to the Secretary and it was transmitted to Congress in the later part of 1924 just before the close of the first session of the Sixty-Eighth Congress.[30]

The commission made the following recommendations for changes in reclamation policy in order to establish the Federal projects on a firm self-sustaining basis:

1) The lands within the existing projects should be scientifically studied, classified and valued. A comprehensive and detailed study should be made to secure information upon which the project lands may be classified with respect to their power of supporting the farmer and his family, and of repaying the construction costs of the project.

2) Aid and direction should be given the settlers in agricultural development. The commission recommended that construction of projects should include not only reservoirs and canals, but also that all necessary drainage works, the building of suitable distribution

29. This committee consisted of the following: Thomas E. Campbell, former Governor of Arizona and president of the League of the Southwest; James R. Garfield, attorney-at-law, former Secretary of the Interior; Oscar E. Bradfute, president of the American Farm Bureau Federation; Clyde C. Dawson, attorney-at-law, and a director of theChamber of Commerce of the United States; Elwood Mead, engineer, professor of rural institutions of the University of California and former chairman of the California State land settlement board; and John A. Widtsoe, former president of the Utah Agricultural College, and president of

systems for the efficient and economical irrigation of the land, and the expense of clearing and levelling project land should also be included in the construction cost of the project. Furthermore, the Government should provide adequate credit facilities for the settlers as a part of the reclamation policy. In addition, settlers should be selected according to ability, which would include industry, experience, character, and possession of a part of the capital needed in improving their farms. And, of utmost importance, adequate legislation should be passed to prevent speculation in project lands. All privately owned land in excess of the single farm unit should be acquired by the United States or placed under the control of the Reclamation Bureau by contract for subdivision and sale to settlers at a price approved by the Secretary.

3) The management of the project should be assumed by the water users. After investigating the various projects, the commission found that the settlers were depending on Federal paternalism and that a corresponding bureaucratic tendency had grown up within the Reclamation Service. The commission recommended that as soon as two-thirds of the irrigable area of any project were covered by water-right contracts, that the water users' association take over the operation of the project. This should be a condition precedent to the granting of any relief measures.

4) A scientific and adequate plan of repayment should be adopted. Such a plan should include the following essential points:

a) The total construction cost should be spread over the

(Cont'd) the University of Utah.

50. Sen. Doc. 92, 68th Cong., 1st sess. This report is a valuable source of information for reclamation policy during 1902 - 1924, and the problems connected therewith.

whole acreage for which the irrigation works have been constructed. If additional land is later included, the charges should be readjusted accordingly. If any land is found unsuited for cultivation, the construction charges apportioned to that land should be charged off as a loss, instead of requiring the remaining cultivated land to bear a heavier burden.

b) The construction charges should be based on the income producing capacity of the different classes of land. The existing method of repayment of project construction costs, based upon time and percentages of costs, instead of the ability of the several classes of lands to produce, was critized by the commission as unscientific and difficult of fulfillment. It was recommended that the annual repayment charges be based on the productive power of the land, and that the annual acre charge should be five per cent of this productive power.[31]

As to new projects, the commission recommended that full information should be secured concerning the water supply, engineering features, soil, climate, transportation, markets, land prices, probable acre cost of development and all other factors upon which the success of the undertaking would depend, before authorizing any extensions or new projects. Moreover, extreme care should be taken in the preparation of the estimated costs, accompanied by a definite statement of what these costs include, and that when once announced by public notice they should be binding alike on the Government and the settler. The commission further recommended that operation and maintenance expenses be paid in advance, as was the policy of private irrigation companies.

31. For this purpose, productive power was defined to be the average gross annual acre income from the irrigated lands for the preceding ten years.

Unfortunately, the report of this commission did not reach Congress until near the end of the session. There was not sufficient time to give adequate consideration to all the recommendations of the commission. A bill was hastily drawn up, however, embodying some of the important recommendations and included in the Second Deficiency Act as section 4.[32] This section of the act is commonly known as the Fact Finders' Act, for it included those recommendations of the Fact Finders' Commission as to (a) the approval of new projects; (b) the selection of applicants for entry; (c) the classification of lands and the exchange of lands by entrymen; (d) the adjustment of construction charges to conform with the productive capacity of the land, in installments to be 5% of the average gross annual acre income for the past ten years; (e) the transfer of projects to the water users' associations; and (f) the payment of operation and maintenance charges in advance.

No provision was made in the act to enable the Reclamation Service to control the excess holdings of private landowners or the price at which this land might be sold. In the annual report of the Bureau for 1924, Commissioner Mead urged that additional legislation be passed to provide for the problem of private land holdings. He feared that the act of 1924 might add to the problem, and stated as follows:

> "Although private land projects may be taken up and constructed by the United States under the Reclamation Act, it was never the purpose of that act to subsidize private owners by furnishing interest-free money to develop their excess land holdings, leaving them free to capitalize the Government's investment in reclamation works and add it to the price at which they sell their excess holdings to actual settlers. Nor was it the intention to improve arid estates by supplying water and then leave the owners of those estates to create a system

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32. 43 Stat. 701, sec. 4.

of tenantry and rent the land on an irrigation basis.

> Yet the law in its present form is conducive to both of these things and both have happened repeatedly. Lack of adequate authority has prevented the Bureau of Reclamation from adopting a coordinated or orderly subdivision and settlement of these privately owned properties. In too many cases high prices asked for land, held in large tracts before the Government works were authorized, have retarded settlement and agricultural development, have increased tenantry, and made the act an instrument for creating poverty among oversanguine and inexperienced farm buyers." (p. 4.)

The classification of lands and the surveys authorized in the Fact Finders' Act were made immediately and the findings of the commission were embodied in the OmnibusAdjustment Act of 1926.[33] Adjustments in the cost accounts were made for the Belle Fourche, Boise, Carlsbad, Grand Valley, Huntley, King Hill, Klamath, Lower Yellowstone, Milk River, Minidoka, Newlands, North Platte, Rio Grande, Okanagan, Sun River, Shoshone, Umatilla, Uncompahgre and Yakima projects.[34] The total construction costs of these projects were reduced by the amounts attributed to lands permanently unproductive because of the character of the soil and topography, inadequate water supply, or because they were used for other purposes than agriculture, such as right of way for the railroad and town sites. Adjustments were also made for errors in the original estimates of the irrigable area and for faulty construction of the irrigation works. Construction charges were suspended for lands temporarily unproductive because of lack of fertility in the soil, shallow or sandy soil, seepage, excessive alkali salt, probably insufficient water supply, damage by erosion, forest covering and rough topography, inadequate storage and uncontracted areas. Further reductions from total costs

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33. 44 Stat. 636.
34. The Commission's report was submitted to Congress in 1926 and was entered as House Doc. 201, 69th Cong., 1st sess.

were made for all items of operating and maintenance expenses which had accumulated and were unpaid prior to the reclamation extension act of 1914.

All lands found by the classification to be permanently unproductive were excluded from the project and were to receive no water from that time on, unless and until restored to the project. All settlers occupying these lands under homestead entries were given the opportunity of exchanging them for productive lands within the same or some other Federal reclamation project. The payment of construction charges against the lands classified as temporarily unproductive were to remain suspended until the Secretary of the Interior should declare them to be of sufficient productive power to be placed in a paying class, whereupon the payment of construction charges would be resumed. During this period, however, that construction charges were suspended, the land could remain in cultivation and water for irrigation purposes would be furnished upon payment of the usual operation and maintenance charges. The Secretary of the Interior was authorized to amend the water right contracts in accordance with the above indicated provisions for charge-offs and suspensions, and to provide for an increase in the time of payment of construction costs to the limit of forty years from the date the first payment matured under the original contract. The time of payment for delinquent operation and maintenance charges since 1914 and water rental charges due and unpaid was extended over a period of five years. The readjustments authorized in this act were very liberal and met practically all of the complaints and demands previously made to the Bureau of Reclamation. Extension of the payment period to forty years afforded substantial relief to

the settlers.

It was hoped by the Bureau that the adjustments made in this act, and the extension of the payment period to forty years, as well as the establishment of productivity as the basis of construction charges, would solve the financial difficulties of the settlers and establish the irrigation projects as self-sustaining units. Unfortunately, such hopes were short-lived. After 1929 the farmers experienced the same financial difficulties that characterized agriculture throughout the country. Most of the settlers were heavily in debt and the income from their crops was, in many cases, the lowest it had ever been. There was a demand for further relief from the construction charges. The general attitude in Congress was that inasmuch as relief was being granted to other groups in the country, that the settlers on the Federal irrigation projects were entitled to the same consideration. The construction charges have accordingly been suspended for each year since 1931.

Privately-owned lands.

A definite attempt was made after 1924 by the Bureau of Reclamation to bring about the sub-division of excess holdings and to regulate the prices at which privately-owned lands would be sold. In all of the acts authorizing the construction of extensions of old projects or of new projects after that time, definite provisions were included with reference to privately held lands. For example, the act authorizing the construction of the Vale project provided that a contract must be made with the irrigation district including all public and private lands, and that no part of the appropriation should be spent on construction until the private owners had agreed to provide for an appraisal, approved by the Secretary of the Interior,

showing the present bona fide value of all such irrigable lands, fixed without reference to the proposed construction. Furthermore, they were to provide that until one-half of the construction charges against said lands shall have been fully paid, no sale of any private holding would be valid until the purchase price were approved by the Secretary.[35] In 1926 this provision was generalized by the Adjustment Act to apply to all new projects or the construction of new divisions to old projects.[36] Thereafter, no excess holdings could receive water for irrigation purposes if the owners refused to execute contracts for the sale of such lands under terms and conditions satisfactory to the Secretary of the Interior and at prices not to exceed those fixed by the Secretary.

This legislation did not, however, entirely solve the problem of privately owned lands; nor did it give the Bureau any control over the selection of settlers for these lands. In 1930 the Secretary stated in his annual report that "there must be a revision of laws for reclaiming privately owned lands. Nearly all the future projects will be mosaics of land in public and private ownership. After spending millions of dollars on reclaiming these holdings, the Government has no control over the qualifications of the people who settle private lands. As reclamation construction costs on the newer projects are frequently in excess of $150 per acre, it is vital that the dry-land price of these lands be held down to a non-speculative basis."[37]

35. 43 Stat. 1168. The same provision is embodied in the acts with regard to the Newlands project, wherein the Southern Pacific Company owned a large portion of the land (43 Stat. 1167 and 44 Stat. 482); the Yakima project (Kittitas division, 43 Stat. 1170); and the Sun River, Owyhee, Vale and Baker projects (44 Stat. 479).
36. 44 Stat. 648.
37. Annual Report of the Secretary of the Interior, 1930, p. 20.

The Secretary accordingly suggested that Congress should consider the possible desirability of legislation which will permit the reclamation fund to purchase all surplus land within a project area, to prevent speculation and to preserve to the Reclamation Bureau the choice of properly equipped settlers. The same consideration would also apply to land sold for tax delinquencies, as repeated delinquencies raise the capital charge on the land to a point where the Federal repayment obligation cannot be undertaken by a purchaser and the land thus remains indefinitely unproductive.[38] The purchase of private lands by the Government is probably the only complete solution to this problem. Congress has never been enthusiastic about such a policy, however, considering it beyond the legitimate activities of the Federal Government in reclaiming arid lands. Consequently, no further action has been taken to prevent speculation activities or to give the Bureau of Reclamation authority to select settlers for private lands.

Management of the projects.

Under the Fact Finders' Act of 1924, decentralization was accomplished as rapidly as possible. By June, 1932, contracts had been made with the irrigation districts and water users' associations on twenty-one of the projects for the transfer to local control of the care and operation of the irrigation works of the projects or divisions thereof. The Secretary of the Interior reported that satisfactory results appeared immediately upon transfer of control. The economic conditions of the water users were improved and their relations with the Government upon transfer were much more cordial. Under the new arrangement with the associations, the money required

38. Ibid., p. 21-22.

to operate and maintain the system was raised in advance. Formerly, the necessary funds had been appropriated from the reclamation fund to be repaid at the end of the year. This policy had served to further the feeling of dependency on the Federal Government and the attitude on the part of the settlers that such expenses need not be paid by them.

The local pride and morale of the group was improved and there appeared to be a greater effort to meet the payments due the Government. The Secretary stressed the fact, however, that decentralization of management did not lessen the responsibility of the government for the proper maintenance of the works, and that "the need for continuous and careful supervision by the Government is emphasized by the fact that there will be a strong temptation for local managers to reduce maintenance expenses at a loss in efficiency and safety with a certainty of large expenditures later on. Provision has been made for systematic supervision."[39]

Problems of settlement and development.

Under the provisions of the Fact Finders' Act, the Bureau adopted the policy that all applicants for public lands must be in good health; they must be experienced in farm work; and they must possess a capital in cash or equipment of $2,000. For the development of raw land under irrigation the capital requirement is too low. An investigation of several of the projects was made in 1929 and reported that the minimum on which an irrigated farm unit could be developed without excessive loss of time is cash or reasonable cheap credit amounting to $5,000, and that the farm will not be fully equipped and productive until the capital equipment is in-

39. Annual Report of the Secretary of the Interior, 1927, p. 23.

creased to $7,500 or $10,000.[40] It is impracticable to raise the cash capital requirement, however, inasmuch as there are few applicants who have $2,000. These qualifications, of course, refer only to those applicants for public lands. No requirements can be made for farmers who purchase private lands. Inasmuch as a large part of the projects are privately owned, the problem of settlement and development is a very difficult one to handle.

The Bureau recommended in 1925 that the greater part of the responsibility for the Federal irrigation projects should be turned over to the States. Inasmuch as the States would receive the benefits in the form of increased taxation, they should assume the responsibility for the settlement of the project and financing of the settlers. As stated by the Secretary of the Interior, "after the works are built, they would be turned over to the State under the terms of a contract entered into before construction started, under which the State would become responsible for directing and financing of the subdivision of the land, the settlement and development of farms, and the repayment to the Government of the construction costs."[41] In accordance with this recommendation, the acts after 1924 which authorized the construction of new projects included certain requirements for cooperation from the States. For example, the act authorizing the construction of the Spanish Springs division of the Newlands project provided that the "Secretary of the Interior is authorized to enter into such contracts as may be possible whereby the State of Nevada, or local interests, shall aid

40. Economic Survey of Certain Federal and Private Irrigation Projects, 1929, printed in the hearings before the House Committee on Irrigation and Reclamation, 71st Cong., 2d sess., p. 49.
41. Annual Report of the Secretary of the Interior, 1925, p. 15.

in promoting the development and settlement of the project after completion by the securing and selecting of settlers and the financing of them to enable the purchase of the required livestock, equipment and supplies and the improvement of the lands to render them habitable and productive."[42] In the Omnibus Adjustment Act of 1926 a general provision was included authorizing the Secretary of the Interior to enter into agreements with the States whereby such States shall cooperate with the Government in promoting the settlement of projects.[43]

The results from the few agreements effected with the States under these acts proved to be very slight. The States and local interests have refused to assume any responsibility whatsoever for the proper development and prosperity of these projects. In the report of the investigating committee in 1929, the following comments are made on the lack of State participation:

> "Reclamation under the national reclamation act has proceeded with little cooperation on the part of the States having projects within their borders. These States have given no formal authorization for such projects nor have they assumed any responsibility for their construction, settlement, and operation.
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> The whole effort at reclamation down to the present has been a cooperative enterprise between the Federal Government and the settlers, with the expectation that the construction, operation, and maintenance costs incurred by the Government would all be repaid by the settlers. Thus the whole cost and labor of reclamation rests ultimately on the settler, except insofar as the advances of construction costs on an interest free basis represents a subsidy from the Government. The settler has received little help from the owners of lands adjacent to his project whose holdings are increased in value and whose operation is stabilized by his efforts, or from the communities whose volume of trade he is increasing, or

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42. 43 Stat. 1167. Also see the provision with regard to the Vale project (43 Stat. 1168); Yakima project, Kittatas division (43 Stat. 1170); Sun River project (43 Stat. 1166); and Owyhee and Baker projects (44 Stat. 479).
43. 44 Stat. 649.

> from the county to which his project brings a better balanced industry, increased valuation for taxation, better educational, and social conditions. Neither has he received organized help, other than through the agricultural extension service, from the State which benefits through increased production, greater volume of business, and increased valuation. All are interested in his success, none has assumed any financial obligation to assist him in his efforts."[44]

The Bureau has advocated that the Federal Government should provide credit facilities for the settlers, give advice and assistance in development of the project, and bear the cost of preparing the land for cultivation as a part of the construction costs. The Secretary of the Interior questioned whether legislation should not go further and require a guarantee of farm improvement from owners of private lands before construction of Government works on future projects begins.[45] Numerous bills have been introduced in Congress to authorize aided and directed settlement on Government projects,[46] and to include the clearing, levelling and preparing of land as part of the original work on the project by the Government,[47] but no action has ever been taken on them by the Committees on Reclamation and Irrigation.[48] The Reclamation Bureau has done everything in its power to encourage the settlement and development of the projects, and has enlisted the aid of the States and the railroads as much as possible to assist with the problem.[49]

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44. Economic Survey of Certain Federal and Private Irrigation Projects, 1929, op. cit., p. 54.
45. Annual Report of the Secretary of the Interior, 1927, p. 23.
46. S. 1033, H. R. 270, 69th Cong., 1st sess.; H. R. 355, S. 2829, H. R. 9956, H. R. 10491, 70th Cong., 1st sess.
47. S. 4131, 69th Cong., 1st sess.; H. R. 5741, S. 1134, 70th Cong., 1st sess.
48. See the hearings on Aided and Directed Settlement on Government Irrigation Projects, H. R. 9956, House Committee on Irrigation and Reclamation, 70th Cong., 1st sess. Also see the hearings on the Economic Survey of Certain Federal and Private Irrigation Projects, House Committee, 71st Cong., 2d sess.

Construction policy after 1924.

In the annual report of the Bureau of Reclamation for 1924, Commissioner Mead stated the need for a long-time plan for future development. There were, at that time, a number of projects which were only partly developed. The completion of these projects would practically exhaust the annual receipts of the reclamation fund, and prevent the adoption of new projects. At the same time, there were constant demands being made to Congress by the States for the adoption of new projects, and by private irrigation companies to be taken over by the Reclamation Service. Many of the Western States had passed laws to exempt irrigation district bonds from taxation in order to encourage private undertakings. Construction proceeded rapidly under these acts, especially in California and Oregon, but many of the projects proved financially unsuccessful. There was, consequently, a temptation, as stated by Commissioner Mead, "to look to the reclamation act as a life-saver for these dubious enterprises." In order to prevent political pressure in the adoption of new projects, it was highly essential that a definite program of development be formulated. Although no such definite program for the location and order of construction of new works was devised by Congress, the general policy was adopted by the House Committee on Irrigation that the reclamation fund for the ten year period following 1924 should be devoted primarily to the completion of existing projects,[50] although a number of surveys were made for new

49. The need for adequate credit facilities, cooperative activity in processing and marketing products, and supervised development of the projects is discussed in a study by Dorothy Lampen, "Economic and Social Aspects of Federal Reclamation", The Johns Hopkins Press, 1930.

50. In particular, Congress provided for the completion of the following projects: Sun River (43 Stat. 1166, 44 Stat. 479); North Platte (43 Stat. 1167); Shoshone (44 Stat. 484);

projects and several extensions and additions to old projects and a number of new projects which had long been under consideration were authorized during the period.[51]

In 1926 the Bureau drew up a construction program which provided for the completion of projects under construction or authorized by Congress. It was anticipated at that time that the receipts of the reclamation fund would be approximately $10,000,000 a year, and on the basis of a yearly expenditure of $10,000,000 it would require approximately ten years to complete this program. There was, however, a large shrinkage in the reclamation income to less than half that anticipated by the Bureau, due primarily to the suspension of construction charges which seriously curtailed the work of the Bureau.[52] In order to partially offset this difference between the anticipated and the realized income, Congress authorized the Secretary of the Treasury to advance funds to the Bureau to a total of $5,000,000,[53] and an additional $5,000,000 was advanced by the Reconstruction Finance Corporation for construction of projects or divisions of projects then under construction or approved by Congress. These advances are to be repaid from the reclamation fund.

There was a continually increasing demand from private irrigation projects that they be assisted by the Federal Government. These requests were due not only to the general agricultural distress after 1930, but also very often to a shortage of water and need for better

(Cont'd) Minidoka, (44 Stat. 958); and Grand Valley, Boise, Milk River, Klamath, Belle Fourche, and Yakima (46 Stat. 1145).

51. The following new projects were authorized: Newlands project, Spanish Springs division (43 Stat. 1167); Vale, authorized in 1925 (43 Stat. 1168); Salt Lake Basin, authorized in 1925 (43 Stat. 1170); Owyhee, authorized in 1926 (44 Stat. 479); and the rehabilitation of the Bitter Root project, authorized in 1930 (46 Stat. 852).

52. See the Annual Report of the Secretary of the Interior, 1933.

53. 46 Stat. 1507.

irrigation facilities. Bills were introduced in Congress providing for the authorization of the adoption of these private undertakings as Federal projects and for their rehabilitation.[54] Many of these projects had been investigated by the Bureau and were considered worthy of Federal assistance but the lack of funds prevented the consideration of new construction work. In the annual report of the Secretary of the Interior for the year 1932, the following statements are made in reference to the need for the extension of the activities of the Bureau of Reclamation to these privately developed irrigation projects:

> "With the fund thus depleted we are confronted, on the other hand, with requests in greater numbers than ever before for investigations looking to the rebuilding of older irrigation canals or the construction of reservoirs to increase the water supply. These requests are not for investigations to determine how unpeopled desert land can be reclaimed but to determine how the people living in old-established irrigation districts and on highly improved farms can obtain a water supply sufficient for their needs.
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> Changes in the economic life of the arid region are increasing the consumption of water. To meet this, works for conserving flood waters must be built. . . The districts confronted with this situation are not able themselves to raise the money for these improvements nor can they obtain it from private loans. Private and district irrigation developments have almost ceased. There is no present market for irrigation bonds. Few of the arid States are financially able to aid in the reconstruction of these works and a majority are prohibited by constitutional limitations.
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> . . . . . .
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> To meet this situation and prevent the wholesale impoverishment and abandonment of highly improved farms the Bureau of Reclamation is being called upon to work out programs for protecting and preserving existing developments. Some of the most urgent appeals come from areas like the San Joaquin Valley in California, the Salt Lake Valley in Utah, and the Platte and Arkansas Valleys in Colorado, Wyoming, and Nebraska. . . . . <u>What is sought is to preserve farms already established, to complete</u>

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54. Namely, Big Lost River (H. R. 13557), Crane Creek (H.R. 13529), Lewiston Orchards (H. R. 13536), and Walker River (H.R. 13527), 72d Cong., 2d sess.; and Cabinet Gorge (H. R. 9006), 73d Cong., 2d sess.

development already begun and on which large sums of money have been spent, and to save to the men living on western farms the fruits of their expenditures and their toil." (pp. 101-103.)

When the Public Works Administration was established in 1933 these irrigation projects were ideally suited for its purposes. Most of the projects had been surveyed and construction could begin at once. Some of them had already been approved by Congress. By June of 1934 authorizations had been made for a total expenditure by the Reclamation Bureau of $55,870,000 (not including the Boulder Canyon or Columbia River projects) as shown in Table II.

Criticism of irrigation policy.

The irrigation policy of the Government has been constantly criticized since 1920 on the ground that it was adding to the agricultural surpluses and thereby furthering the financial difficulties of the farmers in other parts of the country; that one group of farmers were being benefited at the expense of all other farmers who had borne all the costs of developing their property. The settlers on the Federal projects also objected to any extension of reclamation activities as they feared such competition. This opposition was directed particularly toward the rehabilitation of private projects and the irrigation of private lands. The National Grange has repeatedly requested that no new projects be authorized. These objections are generally coupled with charges of extreme bureaucracy against the Bureau of Reclamation.[55]

The activities of the Public Works Administration in respect to irrigation projects brought renewed objections to the general policy. When the list of projects which was adopted by the Administrator of

55. See the Congressional Record, Vol. 69, Part 9, p. 9509; and Vol. 76, Part 5, p. 4756.

TABLE II.

Allotments of the Public Works Administration to Irrigation Projects as of June 30, 1934

State	Locality	Character of Work	Amount
Oregon	Owyhee	Reclamation project	$5,000,000
"	Vale	" "	1,000,000
Washington	Ellensburg	" "	60,000
Oregon	Deschutes	For the purpose of making further investigations to find a means of conserving the available water supply of the valley	50,000
Colorado	Denver	Quarters and facilities for the Reclamation Bureau	20,000
Wyoming		The Casper-Alcova project	12,000,000
Arizona	Yuma	Drainage	120,000
Idaho	Boise	"	100,000
"	Upper Snake	Storage	4,000,000
"	Minidoka	Lateral extensions	400,000
Montana	Bitter Root	Reconstruction of project	100,000
"	Milk River	Laterals and small structures	65,000
"	Chain Lakes	Storage to stabilize existing rights	2,000,000
"	Sun River	Extension of lateral system	600,000
Nevada	Newlands	Truckee storage project	1,500,000
"	Humboldt	Additional storage	2,000,000
N. Mexico	Rio Grande	Drainage	500,000
Oregon	Stanfield	Reconstruction of canals	100,000
Utah	Nyrun	Dam and reservoir	930,000
"	Ogden	Ogden River development	3,000,000
Arizona		For making a survey and preparation of plans for the Verde project and for the construction of the first unit, the Camp Verde Storage Reservoir	4,000,000
"		For a study of the Parker-Gila project	100,000
Utah		For beginning the construction of the Provo River project	2,700,000
"		For the Moon Lake Reservoir on Lake Fork River	1,500,000
"		Construction of Ephraim and Spring City units of the San Pete irrigation project	300,000
"		Reconstruction of the Uncompahgre project	2,725,000
	Total, Bureau of Reclamation		$44,870,000

Source: Public Works Administration, Sen. Doc. 167, 73d Cong., 2d sess., pp. 74-5.

Public Works was presented to Congress for authorization, Representative Culkin led the opposition and flayed the House with criticism of the policy.

> "The greatest economic crime in the history of civilization has been the policy of reclamation blindly and stupidly followed by the Reclamation Bureau during the past thirty years.
>
> In the city of Chicago, during the pending civic crisis, the vice commission charged with bringing the criminal element of that city to book designated certain underworld leaders as public enemy No. 1, public enemy No. 2, and so forth. I here and now indict and charge the Reclamation Bureau of the Department of the Interior as public enemy No. 1 of the United States. This outfit has brought the farmers of the country to their knees and has well-nigh destroyed them. The unhappy condition in which the farmer, East and West, now finds himself is largely due to this reclamation folly which has been fostered and propogandized by public officials and with public moneys."[56]

This criticism not only greatly exaggerates the effect of irrigation farming on the general farm situation in the United States, but it also greatly exaggerates the part played by the Federal Government in irrigation farming. In 1930 approximately fourteen million acres in the seventeen Western States were under irrigation. Of this total, about one-third was controlled by individuals or informal partnerships; another third was supplied through cooperative or mutual enterprise; about one-sixth was served through irrigation districts; Federal irrigation projects accounted for about one-tenth; and the small remaining fraction was dependent on commercial irrigation systems.

It was to meet these criticisms of Federal reclamation that Secretary Ickes requested an economic appraisal of Federal reclamation by F. E. Schmidt, Editor of the Engineering News-Record, and John W. Haw, Director of the Agricultural Development Department of

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56. Congressional Record, Vol. 76, Part 5, p. 4756.

the Northern Pacific Railway Company. In his letter of request, Secretary Ickes stated as follows:

> "The widely conflicting views now held on the value of Federal reclamation as a national policy show the need for a better understanding of its operations and results. In measuring its achievements, consideration should be given to its contributions to the national welfare and the opportunity it creates for those settlers who are obligated to pay the cost."[57]

The report of this committee definitely stated that they had found Federal reclamation "to be an essential agency of social and economic development, one that during its thirty years of activity has contributed decisively to the growth of the western half of the country and to the balanced development of the Nation as a whole. We are of the opinion that it is clearly a desirable, and indeed indispensable, national policy."[58] The committee further declared that reclamation has been a fundamental agency of public welfare, and consequently of national interest, in broadening the base of the country's food supply, in strengthening and supporting its industry, in enlarging and building up the Nation's transportation system. The attitude of this committee as to the relation of Federal reclamation to the public welfare is in accord with the arguments of the advocates for continuation and extension of the policy. Present trend of policy under the Federal public works program indicates that Federal reclamation will be extended, regardless of the opposition of the agrarian interests.

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57. Report on Federal Reclamation, 1934, submitted to the Department of the Interior, p. III.
58. Ibid., p. IV.

Policy with Respect to the Development of Power on Federal Irrigation Projects

The only mention at the hearings on the reclamation bill in 1902 of the possibilities of water power in connection with the irrigation projects was to the effect that the power privileges not already appropriated should be appraised and disposed of at a reasonable valuation, and the benefits to present users of waters of these rivers for power purposes arising from the increased and more steady discharge due to storage should be assessed and paid for by such users.[59] It was not contemplated at that time that the Government would make any attempt to provide for power generation in connection with the irrigation works. It was generally realized that the construction of dams and the provision for storage of water would be valuable for power, but the subject of water power was not of sufficient importance, particularly in the regions where these irrigation projects would be constructed, to merit any special attention.

The original act of 1902, consequently, said nothing about the development of power. It came, rather, as the result of the necessities of the case. The Secretary of the Interior was given wide discretionary powers as to the construction of projects. The Department, accordingly, pursued the policy of constructing power plants wherever they were necessary for pumping water for irrigation purposes or to furnish power during the construction of the project. An example of the latter situation arose when construction was commenced on the Salt River project. It was seventy-five miles from the nearest railroad station and, hence, very expensive to procure coal. A power plant was built at an expense of $557,560. The

59. See the hearings before the Committee on Irrigation of Arid Lands, 56th Cong., 2d sess.

Department estimated, however, that the construction of the plant had resulted in a considerable saving in building the Roosevelt Dam. After the project was completed, the power generated at the plant was more than sufficient to meet the needs of the irrigation district, so the surplus power was sold to Phoenix and nearby communities.[60]

The subject of power was casually mentioned in the early reports of the Bureau as bringing in additional but small revenue, and used in the operation of the project. These reports, however, mention the large potential supply of power on some of these projects. By 1906 the matter of disposal of excess power from the project plants was of sufficient importance to merit congressional action. An act was passed at that time providing that "whenever a development of power is necessary for the irrigation of lands under any project undertaken under the said reclamation act, or an opportunity is afforded for the development of power under any such project, the Secretary is authorized to lease for a period not exceeding ten years, giving preference to municipal purposes, any surplus power or power privilege, and the moneys derived from such leases shall be covered into the reclamation fund and be placed to the credit of the project from which the power is derived."[61] In other words, power revenues were to be deducted from the total cost of the project which must be repaid by the water users.

Although the above act indicated that power might be developed wherever the opportunity was afforded, it was not anticipated by

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60. The potential power at this project was large, and was later fully developed by the water users' association at a total cost of $3,469,706 by 1927. The revenue received from the sale of the power was more than enough to pay for the construction charges of the project. During 1927 the cost of operation of the plants was $173,485.33 and the gross power

Congress or the Bureau of Reclamation that the cost of construction of the irrigation works would be materially increased by power development or that power would play a very important role in reclamation policy. The capacity of the power plants were limited by the irrigation works and the needs of the project for power. There was no effort to make the largest possible use of the power opportunities. When construction of the irrigation works was completed and the contracts for repayment were made, the cost of the power plant was included as a part of the construction cost and the water users were obligated to repay this cost in the same way as the cost of other features of the project works. The income from the sale of any excess power was, accordingly, credited to that project in the same manner as was the revenue from the leasing of project grazing land or the sale of town sites.

A change in policy was made in 1924 under the Fact Finders' Act as a further relief measure. Subsection I of this act provides that the accumulated net profits derived from the operation of "project power plants . . . . should be credited to the construction charge of the project, and thereafter the net profits from such sources may be used by the water users to be credited annually, first on account of construction charges, second, on account of project operation and maintenance charge, and third, as the water users may direct. No distribution to individuals shall be made out of any such profits before all obligations to the Government shall have been fully paid."[62] Thereafter, consequently, power revenues

(Cont'd) sales totalled $1,237,452,60.
61. 34 Stat. 117.
62. 43 Stat. 703.

were applied on the annual construction and maintenance payments of the particular project on which the power was developed.

After 1920 the possibility of power development became increasingly important and the revenue therefrom, if the potential power were fully developed, began to assume considerable importance. The Bureau of Reclamation wished to more fully realize this source of income, but to distinguish power development from the irrigation project and credit the proceeds from power to the reclamation fund rather than to the project from which the power was sold. There was a gradual approach to this policy during the twenties, although there was no definite formulation of power policy. The general law and policy embodied in the Fact Finders' Act, however, was modified in certain respects with regard to particular projects. For example, by special provision in the Appropriation Act of 1930, it was provided that net revenues derived from the operation of the power plant on the Boise project were to be applied (1) to the construction cost of Deadwood Reservoir; (2) to the construction cost of the power plant and power system; and (3) to one-half of the construction cost of the Black Canyon Dam. Thereafter, all net revenues from the sale of power were to be covered into the reclamation fund.[63] No indication was given, however, as to the basis for this allocation of costs.

In 1934 the Bureau of Reclamation attempted to obtain from Congress a definite formulation of policy with regard to power on the Federal irrigation projects and the distribution of revenue therefrom. A bill was drawn up for this purpose with the following

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63. 45 Stat. 1592. Also see provisions in this act for the Shoshone project. Similar provisions for the Yakima project were provided in 1932. (46 Stat. 308.)

essential provisions:[64]

1) That any power systems constructed after 1934 on the Federal projects should be operated by the United States as a distinct and separate system, independently of the irrigation system.

2) The construction cost of the power system, including such portion of the cost of structures and other facilities provided and used primarily for irrigation purposes but incidentally used in connection with the development of power, shall be returnable from the power revenue. Such costs shall not be charged to or repaid by the water users on the project. The allocation of costs shall be determined by the Secretary of the Interior, and his finding shall be conclusive.

3) All power needed by the irrigation district for construction or operation of the project works shall be sold to the district at a rate to be determined by the Secretary.

4) All revenues received from the operation of the power systems shall be covered into the reclamation fund, and "shall not be credited in payment of any obligation payable by the water users of the project."

5) Any additional construction work to existing power systems shall be put upon the same basis as new systems.

The hearings on this bill revealed that the purpose of the bill was threefold. In the first place, the sources of the reclamation fund, namely, from the sale or leasing of public lands, and from the leasing of water power sites, were limited and, on the whole, non-recurring. The Department desired to use the revenues from power development to increase the fund and further extend reclama-

64. H. R. 9124, 73d Cong., 2d sess.

tion operations. Secondly, many of the projects proposed and considered at this time necessitated a large initial expenditure for storage reservoirs which would make the cost of irrigation too great for the individual farmers to carry. By developing the power, however, which would be available with the construction of the storage dams, and allocating a large part of the cost of the project to the power development, the water charges could be greatly reduced.[65] Thirdly, the Bureau wished to develop the potential power possibilities to the utmost, rather than leaving the power as a by-product of the irrigation system. The water users could not undertake the power development to any great extent because of lack of funds. And there was no reason why the Government should undertake such development if the revenue were merely to be turned into the account of that particular irrigation district. In a letter from Secretary of the Interior Ickes to the Committee in regard to this bill, the Secretary stressed the growing importance of power development, in helping to pay the cost of the irrigation works and in creating better social and economic conditions in the communities which irrigation development creates.[66] Preference would be given to the municipalities in disposing of this power at rates set by the Secretary.

The bill was reported out of the Senate Committee without amendment and passed the Senate, but met opposition in the House Committee. The objection immediately arose, as would be expected, that such an act would put the Government into the power business,

65. In the Casper-Alcova project, now under construction by the Bureau under the Public Works program, a large part of the original cost of the works is allocated to power.
66. See the hearings on the Distribution of Power Revenues, House Committee on Irrigation and Reclamation, 73d Cong., 2d sess.

and that the development of power should be incidental to the irrigation project. A much more serious objection, insofar as the passage of the bill was concerned, was the fear that the contemplated separation of the power system from the irrigation project would increase the cost of irrigation to the settlers on those projects where power was, or could be, an important item of revenue. The bill was reported out of the House Committee but no action was taken on it during that session.[67] The same bill was again introduced in 1935, but again no action was taken.[68] It is essential that a definite policy be formulated for the development of power on the Federal irrigation projects and the distribution of such power. Care should be taken, however, to reconcile the power policy with regard to irrigation projects with national power policy in other respects.

Conclusion.

Federal irrigation policy which was initiated in 1902 at the combined efforts of the conservationists, the Western States and existing private enterprises, was a compromise with the Eastern business interests, providing that all funds expended for such purposes be derived from sales of public lands and that the projects be self-liquidating. In the administration of the projects, difficulties have been encountered in the collection of water charges, settlement and development of the projects, and speculation in the project area lands, which have necessitated changes of

67. An amendment was offered by Representative Carter (of Wyoming) that the Secretary of the Interior should be authorized to make loans to those municipalities, for the purpose of constructing or acquiring electric distributing systems, that have connection with the reclamation projects. The purpose of such loans was "to aid in providing a market for electricity generated at any electric power works on a

policy. Experience has shown that the construction of the irrigation works is not sufficient to establish the projects as prosperous undertakings. It would appear to be necessary that private land holdings within the project be purchased by the Federal Government to prevent speculation and the realization of unearned increments by the capitalization of the water privileges. Furthermore, the settlers must be given financial assistance in building homes, securing equipment and preparing the land for cultivation. It is also necessary that agricultural advisors be provided for each project to assist the settlers in determining the most desirable crops for their lands and the proper method of cultivation and land utilization. The study of irrigation policy reveals that each project has been considered as an individual commercial undertaking and as a separate use of water. No consideration has been given to other aspects of water utilization and to the use of water in other parts of the drainage basin unless a direct conflict arose. Power has been developed on the projects as a by-product only, to meet the direct needs of constructing or operating the project.

(Cont'd) reclamation or other Federal project and thereby facilitate the self-liquidation thereof."

68. S. 1925, 74th Cong., 1st sess.

CHAPTER IV.

FEDERAL WATER POWER POLICY

Federal Policy Prior to 1920.

The precedent for government control of water power resources and the privately owned enterprises using such resources, as well as the development of water power sites by public agencies, was established during the colonial period. The control over the water power mills was early assumed by the colonial governments. Water power was used at that time for grist mills and sawmills. In 1629 the New Netherlands legislature gave its colonists the right to use the rivers under certain restrictions and limitations. With the creation of the Union, the States continued to exercise such control over water power resources, mills and rivers. There was no general policy, but many specific rules and regulations were enacted.[1]

The power of the Federal Government to control the use of water power sites throughout the country rests on three delegated powers. First, through the complete power of the Federal Government over the public lands, any rules and regulations for the use or disposal of water power sites located thereon could be made. This power of the Government was never questioned. Secondly, the treaty-making power with foreign governments gave the Government authority over the disposal of sites on international streams. Thirdly, under the commerce clause, the Government has control over all navigable rivers and may, therefore, control the structures erected in such streams. The extent of this power to include complete control over water power sites

1. For a detailed study of colonial and state regulation, see Conover, The Federal Power Commission; Its History, Activities and Organization, Institute for Government Research, The Johns Hopkins Press, 1923.

in navigable streams has been questioned, and was one of the causes of the delay in the formulation of Federal water power policy. Furthermore, the definition of navigable streams has been a source of debate.

Federal legislation prior to 1920 and the fight for more comprehensive legislation which preceded the enactment of the Federal Water Power Act in 1920 will be treated in a summary fashion inasmuch as there are excellent secondary sources for this material.[2] The first acts of Congress with respect to water power related to navigable rivers, the purpose being to prevent the construction of structures in the rivers which might hinder or prevent navigation. The first general legislation on the subject was embodied in the rivers and harbors act of 1884, and directed the Secretary of War to make a survey of all structures in the rivers which were interfering with free and safe navigation.[3] This survey was followed by an express prohibition, in the rivers and harbors act of 1890, of the creation of any obstruction in navigable streams without the approval of Congress.[4] Under this act every separate dam construction had to be approved by Congress. Because of the relative unimportance of hydroelectric development at that time, however, there were not very many authorizations made under this act. In 1899 this provision was extended and Congress assumed complete control over all structures in navigable streams.[5]

The acts of 1890 and 1899 referred entirely to navigable rivers and did not include, consequently, many power sites in non-navigable rivers located on the public domain. Prior to 1896 these sites went

2. See Kerwin, Jerome G., National Water-Power Legislation, for a thorough analysis of this period. A summary of the period is given in the Congressional Digest for October, 1934.
3. 23 Stat. 275.
4. 26 Stat. 426.
5. 30 Stat. 1121.

to patent either as parts of homesteads or by purchase and were given no special consideration by the Government. Many valuable sites passed into private ownership and beyond the control of the Federal Government. Acts were passed in 1891[6] and 1895[7] authorizing the Secretary of the Interior to grant rights of way through the public domain for all necessary irrigation works. Any development of power was considered subsidiary to the irrigation project. In 1896 the Secretary was authorized to fix general regulations to permit the use of a right of way upon the public lands and reservations for the purpose of generating, manufacturing, or distributing electric power.[8] An act of 1901[9] brought together all previous rights of way acts and placed the administration of the act under the Secretary of the Interior. This act provided that the permit granted by the Secretary might be revoked by him or his successors at will. In 1905 the Forest Service was transferred to the Department of Agriculture. Thereafter, permits for water power development on the public domain were issued by the Secretaries of the two departments, subject to the separate rules and regulations prescribed in each department.

In 1906 Congress passed a general dam act which set forth the conditions and requirements for all future specific projects in navigable rivers, although congressional approval was still required for each individual project.[10] Under this act all plans for the work had to be approved by the Secretary of War; construction was to begin within one year and be completed within three years; and no

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6. 25 Stat. 1095.
7. 28 Stat. 635.
8. 29 Stat. 120.
9. 31 Stat. 790.
10. 34 Stat. 386.

time limit was placed on the duration of the grant itself, although the act might be repealed by Congress at any time. Twenty-five special acts had been passed under the general provisions of the general act of 1906 when, in 1908, President Roosevelt vetoed a bill for extension of time for the Rainey River Improvement Company. In his veto message the President laid down the general principles which he believed should govern the granting of water power sites and urged the formulation of a definite federal water power policy which would include the following provisions:

1) Definite time limits for the development of the site, which would be strictly enforced by an administrative agency of the Federal Government.

2) Provision for the maximum development of navigation and power which would not interfere with a better utilization of the water or the complete development of power on the river system.

3) A license charge which could be adjusted to secure control in the public interest.

4) Provision for the termination of the grant at a definite time, leaving future generations determine the manner in which they wished the power site to be developed and operated.

In 1909 the President vetoed the James River bill and again reiterated the above principles. These veto messages brought the whole problem of water power development into the open and marked the beginning of a long, bitter fight for legislation. The principles set forth by President Roosevelt were in accord with the views of the conservationists, whose demands for comprehensive development of river systems have been considered in Chapter I. This group insisted that the exploitation of power sites by private enter-

prises should be strictly supervised to secure the greatest potential power from the streams and the coordination of the various uses of the water. Furthermore, adequate provision should be made to protect consumers from monopolistic rates, and to allow future generations to make any changes which might be desirable to protect the public interest in these valuable natural resources. The power interests, on the other hand, wished to acquire these sites as permanent grants, to be exploited when they so desired. They found allies in the States' rights champions, who insisted that the demands of the conservationists would take away the rights of the states to regulate and supervise the use of water. They based their argument on the ground that the power of the Federal Government to regulate navigable streams was limited solely to the maintenance and protection of navigable channels.[11] The legal aspects of the problem as to the respective powers of the States and the Federal Government over navigable waters played a very important role in this fight for water power legislation. There is little doubt that the private power interests took advantage of this controversy and attempted to gain their ends and delay Federal legislation by obscuring the economic issues by these complicated legal problems. As stated by Phillip P. Wells, one of the foremost figures in this struggle for legislation:

> ". . . that struggle lasted fourteen years and from the beginning to the end of it the clamor for states' rights was continually raised against the proposals of the conservationists, raised in the halls of Congress, in the courts, in contests before the executive departments; but never once was it raised save in behalf of the men who demanded water power grants in perpetuity without those conditions essential for safeguarding public rights which were finally embodied in the Act.

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11. For the substance of this argument see a letter of Senator Shields to Cordell Hull, in the Congressional Record, Vol. 68, Part 2, pp. 1710-11.

From the beginning to the end the deceptive hand was disguised in the hide of state rights, but to the understanding ear the tell-tale voice betrayed the would-be uncontrolled monopolist."[12]

After several years of debate a very weak act was passed in 1910.[13] It was decidedly a compromise measure and wholly unsatisfactory to the conservationists. The fight for strict regulation was next taken up at the conservation convention and nearly resulted in a riot. The two principal issues at that time were tolls and the time limit for the grant. The proponents of strict government regulation wished to set a definite limit on the grant, at which time the site might be taken over by public authority. In the privilege charge they saw a means of enforcing regulation. The charge could vary with the extent of the development of the potential power of the stream, with the rates charged the public and with profits. During the later years of this fight for legislation, the terms of recapture at the expiration of the grant became a leading cause for disagreement. The conservationists were, of course, in favor of strict regulation of accounts and the enactment of specific provisions for the recapture of the site and property at the actual original investment. The private interests, on the other hand, naturally anticipated capitalizing the value of the site and opposed any provisions offered by the conservationists for recapture.

Throughout this period Senator Newlands fought for the realization of his ideal of a comprehensive development of water resources. As has already been stated in connection with the development of navigation and flood control policy, he introduced numerous bills

12. Wells, Phillip P., "Federal and State Control of Power Development and Distribution", Annals of the American Academy, Vol. 129, pp. 126-131.
13. 36 Stat. 593.

for a definite formulation of national policy for water resources. Such a plan would provide for the comprehensive development of water power in conjunction with other uses and control of the river system. The Senator from Nevada spoke so many times on the flood of the Senate on his proposed plan that in 1916 Senator Shields attempted to stop him by directing the attention of theChair to a rule from Jefferson's Manual to the effect that "no one is to speak impertinently or beside the question, superflously, or tediously." Senator Newlands replied that he did not mean to be tedious but reminded Senator Shields that if only ten Senators were in attendance at a time and there were over ninety Senators to convince, he would have to repeat his views at least nine times.[14]

An occasional suggestion was made for government ownership and operation of water power plants but did not receive serious consideration.[14] In 1918, in an address to the Senate, Senator Borah declared himself in favor of government ownership of water power sites, making the following statement in this connection:

> "Water power is monopolistic in its nature, and therefore lends itself to artificial monopoly. . . . It is sufficient to know that in the very nature of things we are to have either a monopoly owned and controlled by the Government or public authority or owned and controlled by private interests tempered by supposed regulation. Some effective and drastic policy of either public ownership or public control is undoubtedly elemental in the framing of any plans or scheme to deal with this subject matter.

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14. Kerwin, op. cit., p. 206.
15. In 1916, during the debates on the Shields bill, Senator Martine of New Jersey stated:
"My solution of this trouble is government ownership, the government construction of all the plants to aggregate and concentrate this power. I believe that not only with reference to water power, but I have believed it with reference to some other great utilities of our country. However, I realize that to urge it is almost to urge heresy."
(Congressional Record, Vol. 53, Part 4, p. 3229.)

> I am for public ownership and control. . . . The more I have studied the question the further I have carried the investigation and the more firmly I am convinced that the leasing system will bring no proper service to these utilities, and that we should adopt, without further experimenting, public ownership, development and control of our water power. . . Water power is interwoven with and inseparably a part of the common service and welfare of the community. . . . Whatever profits there are should go to the people in better and cheaper service. The leasing system in no sense relieves the business of private gain. . . . Theoretically, public ownership will give lower rates, better service, greater diffusion of wealth, and more prosperous communities."[16]

The opposition to strict government regulation came from many sources. The power group, of course, were a solid bloc in their opposition and maintained lobbies in Washington throughout this period. Representatives from the South and West joined the power interests because they wanted immediate development of their power sites and visualized the rapid industrial growth and prosperity which would result therefrom. The West not only objected to Federal control of navigable streams, but also to control of the public domain, which included a large part of many of these states. Such control, so they argued, was undue discrimination against the West. Eastern business and financial interests also backed the power group for the development of the sites on easy terms.

Many bills were introduced during the period 1910 to 1918 which attempted to compromise the demands of the conservationists and the opposition with regard to time limits, repeal or amendment of the act, privilege charges, recapture provisions, and administration of the act. No attempt will be made in this study to indicate these various bills and their provisions. The entire history of this period was, as stated by Kerwin, a "bewildering legislative maze." The struggle was finally brought to a close in 1920 with the passage

16. Congressional Record, Vol. 56, Part.10, pp. 10477-8.

of the Federal Water Power Act.

The Federal Water Power Act

The water power act, as finally passed by Congress, provided for the creation of the Federal Power Commission, consisting of the Secretaries of War, Agriculture and Interior, and an executive secretary.[17] All the work of the Commission was to be performed by and through the working staff of the three executive departments. The Commission was given jurisdiction over water power sites and projects located on the public domain, the federal reservations, and navigable waters.[18] Preliminary permits were to be issued by the Commission for a period of three years, during which time the permittee could obtain all the information and data required by the act as a requisite for a license. The term of the license was limited to fifty years. Upon the expiration of the license, the United States had the right to take over and operate any project upon the condition that "it shall pay the net investment of the licensee in the project . . , not to exceed the fair value of the property taken, plus such reasonable damages to property not taken . . . as may be caused by the severence therefrom of property taken."[19] This net investment shall not include any item for the value of the lands, right of way, or other property of the United States; the license itself; or goodwill, going value or prospective revenues.

The licensee is required to pay annual charges for the purpose of (1) reimbursing the United States for the costs of administration of the Act; (2) recompensing the United States for the use of public

17. 41 Stat. 1063.
18. National Parks were taken from the jurisdiction of the Commission by an amendment to the act in 1921. (41 Stat. 1353.)
19. Section 14.

and Indian lands; and (3) expropriating the excessive profits of the licensee. In order to carry out the provisions for recapture and excess profits, the Commission was given authority to establish uniform accounting practices and to require licensees to make all necessary renewals and replacements and to maintain adequate depreciation reserves to keep the project in condition for efficient operation. Furthermore, the Commission was given authority to control the rates, services and security issues of licensees which were public service corporations, in those cases where the States did not do so. If the licensees were engaged in interstate commerce, the Commission was granted complete authority of regulation.

One of the most important provisions of the act, if interpreted in its fullest meaning, is the provision that the plan for the project shall be such as "will be best adapted to a comprehensive scheme of improvement and utilization for the purposes of navigation, of water-power development, and of other beneficial uses; and if necessary in order to secure such scheme the Commission shall have authority to require the modification of any project and of the plans and specifications of the project works before approval."[20] Wherever the project affected navigable waters, the specific approval of the Secretary of War was required to insure the construction of proper navigation facilities. Special provisions were also made to protect irrigation and domestic water supply.

The act anticipated that the Commission would cooperate with the States in the granting of sites and regulation of licensees, as has been indicated with respect to the regulation of rates and services and the other uses of water. Section 9 (b) required that all

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20. Section 10 (a).

applicants for licenses must submit satisfactory evidence of compliance with the requirements of the State laws as to the use of water for power purposes and the right to engage in business. In issuing licenses, the States and municipalities were to be given preference provided their plans were equally well adapted "to conserve and utilize in the public interest the navigation and water resources of the region."

The act was, obviously, a compromise between the interests of the power group and the ideals of the conservationists. The opponents to strict federal legislation considered the act an ursurpation of sovereign states' rights, and anticipated that the courts would declare the act unconstitutional.[21] Soon after the assumption of duties by the Commission difficulties arose with the State of New York, and suit was instituted against the Commission on the ground that the act was unconstitutional. The suit was dismissed, however, following a conference between the Commission and the State representatives, at which the executive secretary stated that the recapture provision was not primarily to give the United States ownership, but to enable it to serve as an agency for securing this ownership of property for the states and municipalities; and the provision for charges was not intended as a revenue-producing measure.[22]

The State of New Jersey also questioned the right of the Federal Government to control water resources within the state and

21. The position of the states' rights group is clearly expressed in the letter of Senator Shields to Cordull Hull, op. cit., p. 1711.
22. The minutes of this conference and the report of the State conferees to the New York Legislature are printed in the Congressional Record, Vol. 68, Part 4, pp. 4372-4380.

to receive revenue therefrom and sought an injunction to restrain the administration of the act by the Commission. The Court dismissed the bill and refused to consider the questions of constitutionality.[23] No case has been decided by the Supreme Court contesting the constitutionality of those aspects of the water power act indicated by Senator Shields as powers of the State.[24]

Administration of the Water Power Act, 1920-1930

The first meeting of the Power Commission was held on July 1, 1920, and Mr. O. C. Merrill, chief engineer of the Forest Service, was appointed as the executive secretary. One of the first problems to confront the Commission was the organization of a staff to handle the work. The Comptroller of the Treasury interpreted the act to mean that the Commission was without authority to make any direct employments, and that the working organization must be acquired from the personnel of the executive departments of War, Interior and Agriculture. A small staff was assembled but it was difficult to secure a force with the proper qualifications.[25] The Commission had no assigned field force but was required to depend exclusively on the field organizations of the three departments. All of the reports of the Commission from its organization until 1929, at which time Mr. Merrill resigned as executive secretary, commented on the limitations placed upon it by the lack of adequate personnel and a field

23. New Jersey v. Sargent, 269 U. S. 328.
24. For a discussion of the legal aspects of the right of the government to determine and control the uses of water for purposes other than navigation, see "Federal Control of Electrical Energy -- The Power Commission", Columbia Law Review, Notes. Vol. 32 (Nov., 1932), pp. 1171-85; Elder, Charles B., "The Use of Water Power in the Generation of Electricity", Illinois Law Review, Vol. 25 (March, 1931), pp. 759-77; and Plum, Lester Virgil, "The Federal Power Commission", Princeton University, 1936 (unpublished manuscript).
25. See the First Annual Report of the Commission, p. 12.

force of its own.[26] Legislation was repeatedly requested to allow the Commission to hire its own personnel, and numerous bills were introduced into Congress to this effect. Hearings were held but no action was taken during this period.

In addition to this limitation of its working organization, the activities of the Commission were further curtailed by a lack of funds. Although the act had required that the licensees bear the costs of administration, all receipts were paid into the Treasury and all funds received by the Commission were by specific appropriations. At no time during this period were the appropriations large enough to enable the Commission to make the surveys or regulate licensees as directed in the water power act. The Commission repeatedly recommended that the amounts collected from licensees be placed in a special fund, to be devoted exclusively to the purpose for which collected and expended under the direction of the Commission.[27] The appropriations were consistently reduced and the lack of funds prevented the Commission from carrying out the mandate of Congress for comprehensive studies of river systems and the power industry, regulation of accounts, and the proper determination of prelicense costs.

The problems which were encountered by the Commission in administering the water power act can be grouped under the following headings; (1) jurisdiction; (2) comprehensive development of water resources and the relation of water power to other uses of water; (3) granting of preliminary permits and licenses; and (4) regulation of the licensees. These various problems and the policies formulated

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26. Ibid., pp. 15-6.
27. See the Fourth Annual Report of the Commission, p. 9.

for the treatment thereof will be briefly considered.

Jurisdiction of the Commission.

The Commission stated in its second annual report that "the chief purpose in the creation of the commission was to secure a common policy and a single executive agency in water power administration." Inasmuch as the control over water power sites had, prior to 1920, been in the three executive departments, it was anticipated that the appointment of the heads of these departments on the new Commission would result in a uniform policy. Actually, this purpose was not accomplished. Each department retained separate control over all licenses granted prior to 1920, while the Federal Power Commission had control over the licenses after that date. Each agency continued its independent activities, which were not controlled by a common plan or subject to common direction. The Commission recommended that it be given full administrative authority over all Federal water power grants whether issued under the existing or under prior laws.[28]

The second problem of jurisdiction of the Commission arose over the disposal of power sites on the four most important rivers in the United States, from the standpoint of hydroelectric power; namely, the Tennessee, the Colorado, the Columbia and the St. Lawrence. Proposals for the development of these rivers had been discussed prior to the enactment of the power act. No action had been taken, however, except at Muscle Shoals, where the Government had constructed a dam, power plant, and two nitrate plants for war purposes. This property remained under the direct jurisdiction of

28. Third Annual Report of the Commission, pl 3.

Congress,[29] but the control over the remaining power sites on these rivers was given to the Power Commission.

Many applications for sites on these rivers were filed immediately after the organization of the Commission. They were suspended for the time being, awaiting the completion of investigations and the satisfactory conclusion of complicated legal questions. Congress had recently granted permission to the seven states in the Colorado drainage basin to create an interstate commission for the purpose of allocating the waters of the Colorado. Moreover, the development for power was closely connected with the problems of irrigation and flood control. The same problems of irrigation and allocation of water between the States concerned prevented any immediate action with regard to the Columbia. The applications for the projects on the Tennessee and its tributaries were suspended until the investigation then under way by the Army engineers could be completed. On the St. Lawrence, the power development was related to navigation and there were legal complications with regard to the division and use of water by Canada and the United States. Furthermore, the State of New York maintained that power on the St. Lawrence should be publicly developed. Any move of the Commission, indicating its intention to grant licenses for sites on these rivers met with opposition from the States, the Department of the Interior (which was interested in reclamation in the Colorado and Columbia River basins), and the group in Congress who had consistently advocated strict regulation of water power resources and comprehensive development of rivers.

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29. In 1925 a bill was introduced into the Senate to transfer the jurisdiction over this property to the Commission but it was not reported by the Committee on Agriculture and Forestry. (S. 3123, 69th Cong., 1st sess.)

A resolution was made in 1927 and approved by the President, restricting the Power Commission from issuing any permits or licenses on the Colorado River or its tributaries, pending the ratification of the seven States compact with respect to allocation of water or, failing such ratification, until March 4, 1929.[30] At the expiration of this period, the restriction on permits and licenses was further extended until March 4, 1930.[31] A similar resolution was offered by Senator Norris to suspend the jurisdiction of the Commission to issue licenses on the Tennessee and its tributaries until Congress had taken final action to dispose of the Muscle Shoals property.[32] At the hearings on this resolution, Senator Norris expressed the purpose of such action in the following statement:

> "I think if Congress should pass this resolution that I have offered here it would be the first time in history where a great system like the Tennessee River system would be developed scientifically, every unit of it developed with reference to every other unit; and every student of the subject of navigation or flood control or of the development of power by which electricity is transmitted over the country admits, without any exception, that that is the right way to get the maximum amount of electricity, the maximum amount of flood control, and the maximum amount of navigation, at the minimum cost. These private people may do it all that way. I do not think they will. I do not think that is their object. It is my object. I am not finding fault with them. I would pick out the location that would give me the most money, and I would not have the whole thing in view."[33]

No formal action was taken by Congress on the resolution, but an agreement was made with the Power Commission that no permits or licenses would be granted on the Tennessee until some arrangement had been made with regard to Muscle Shoals. With the exception of

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30. S. J. Res. 4, 69th Cong., 2d sess., 44 Stat. 1456.
31. S. J. Res. 201, 70th Cong., 2d sess., 45 Stat. 1446.
32. S. J. Res. 35, 69th Cong., 1st sess.
33. Hearings before the Senate Committee on Agriculture and Forestry, on S. J. Res. 35, 69th Cong., 1st sess., p. 11.

a few licenses on the Columbia, the Commission has granted no sites on these rivers to private interests.

The third problem of jurisdiction centered around the problem of the powers of the Power Commission over non-navigable streams, in regard to which there was strong opposition from the States. In addition to the streams defined in the water power act as "navigable streams", there are other rivers which are within the jurisdiction of Congress under the rule laid down by the Supreme Court in the case of the United States v. Rio Grande Dam and Irrigation Company,[34] wherever the structures erected in non-navigable streams would effect the navigable capacity of the navigable rivers. For example, the impounding of a considerable quantity of water in a non-navigable tributary of a navigable stream would effect the depth of the navigable channel.

Anyone proposing to construct a power project in a non-navigable stream or one of which the navigability was doubtful may follow one of two courses. First, he may construct and operate the project entirely on his own responsibility. In this case, he assumes all the responsibilities and bears the risk of having to remove the structures at his own expense and loss if the War Department should declare them an obstruction to navigation. Secondly, he may file a declaration of intention to construct the project and request a determination by the Commission as to the effect of the project on the interests of interstate commerce. If the Commission finds that the project will affect interstate commerce, construction may proceed only under license from the Commission.

By the close of the first ten years of the administration of

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34. 174 U. S. 690.

the water power act, the Commission had acted on 115 declarations of intention, of which a little less than half were determined to be within the jurisdiction of the Commission and require a license to operate. Major Edgarton, chief engineer of the Commission, stated that the policy of the Commission with regard to non-navigable tributaries of navigable streams was as follows:

1) Licenses are usually required for projects that involve considerable storage on important tributaries on navigable streams.

2) Licenses are not usually required for run-of-water plants on non-navigable streams.

3) Licenses are frequently required for projects that have the physical capacity to produce fluctuations of considerable magnitude in the flow of navigable streams, although the storage available is small in comparison with the annual discharge of the stream.[35]

Throughout this period there was constant objection from the states that the Commission was encroaching upon its rights to regulate the use of non-navigable streams, and that the power granted the Commission with regard to such declarations of intention had been the means for the extension of the authority of the Commission to projects with which it is not properly concerned. Numerous bills were introduced into Congress to amend the act by redefining "navigable streams" and preserving to the States exclusive jurisdiction over power developments on non-navigable waters.[36]

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35. Edgarton, "National Water Power; Federal Water Power Act and Features of its Administration", Electrical World, Vol. 93 (March 9, 1929), pp. 487-91.
36. S. 3500, H. R. 15426, 69th Cong., 1st sess.; S. 840, S. 2652, H. R. 9574, 70th Cong., 1st sess.; H. R. 15575, 70th Cong., 2d sess.; S. 826, H. R. 3821, 71st Cong., 1st sess.; H. R.

No action was taken on any of these bills but they definitely show the opposition to Federal regulation.

In 1930 the New River case focused public attention on the problem of jurisdiction over non-navigable rivers and brought criticism of the Power Commission from all sides. On June 26, 1925, the New River Development Company, predecessor of the Appalachian Power Company, had filed a declaration of intention to construct a dam and power project on New River near Radford in the State of Virginia. The Commission determined that the interests of interstate commerce would be affected and the company was offered a license in standard form.[37] This license was refused and the company proceeded to build a 200,000 horsepower plant without a permit. On February 4, 1930, the company requested the Commission to reconsider the finding that the proposed project would affect the interests of interstate commerce, or in the alternative to issue a minor-part license for the project.

The suggestion that a minor-part license be issued was an original idea. The water power act stated that "in issuing licenses for a minor part only of a complete project, or for a complete project of not more than one hundred horsepower capacity, the Commission may in its discretion waive such conditions, provisions and requirements of this act, except the license period of fifty years, as it may deem to be to the public interest to waive under the circumstances."[38] The legislative history of this provision indicates that it referred entirely to the use of public lands for transmission

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(Cont'd) 5626, 5657, 71st Cong., 2d sess.; S. 626, 72d Cong., 1st sess.

37. Seventh Annual Report of the Commission, p. 114.
38. Section 10 (i).

lines, water conduits and storage reservoirs, as the minor parts of complete projects. There is no indication, either in the wording of the provision or in the consideration of it in the congressional debates, that dams and power plants would ever be considered as minor parts of a complete project. Up to this date, minor-part licenses had been issued for projects of less than one hundred horsepower capacity and for transmission lines on the public lands. This request of the Appalachian Power Company was to grant a minor-part license for a large project in its entirety.

The case was submitted to the Attorney-General who decided that a minor-part license was applicable under such circumstances.[39] In accordance with this decision, the company applied for a minor-part license on October 6, 1930. The first action of the Commission in this case, declaring that the company must obtain a standard license, and the decision of the Attorney-General approving the use of a minor-part license in such a case, brought protests from many quarters. The States seriously objected to the assumption of jurisdiction over any project in non-navigable waters by the Federal agency. The position of the States is expressed in the following quotations taken from a letter of the Governor of West Virginia to the Power Commission:

> "With regard to projects of that nature, it is our view that the Federal Government has no jurisdiction, excepting insofar as the operation of such projects, after construction thereof, might prove somehow to injure navigation on streams to which the project streams are tributary. I do not doubt that under such circumstances the Federal Government through agencies other than that of your commission, has the right and duty to bring about the cessation of whatever causes such harm to navigation. . . . .

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39. This decision of the Attorney-General is printed in full in the Tenth Annual Report of the Commission, pp. 152-6.

> It is not understood why such right and duty to protect navigation under such circumstances can justify the placing of projects, located as above stated, under the jurisdiction of your commission. On the contrary, it is insisted that your commission should not interfere at all in the cases of such projects and that other agencies of the Federal Government should interfere only if and when there is an actual or threatened harm to navigation caused by such projects. In all other respects the regulation of water power projects of the above kind is solely a matter for the control of the individual States. . .
>
> It is a matter of common knowledge that one of the causes, if not the outstanding cause, of delay in the development of our water power is the attitude which your commission has taken with regard to this very type of projects in our State."[40]

On the other hand, the advocates of strict governmental regulation of water power development saw in the decision of the Attorney-General regarding minor-part licenses, a dangerous threat to the operation of the water power act. If minor-part licenses could be granted to entire projects in the discretion of the Commission, exempting the licensee from the provisions of the act, a Commission which was friendly to the power interests could effectively nullify all the safeguards provided in the act.[41]

An act had been passed in June, 1930, which provided for the reorganization of the Commission. There were, consequently, objections from Congress and the general public to the granting of a minor part license to this company by the old Commission during its last weeks in office. In view of the flood of protests, the Commission concluded that a court adjudication was desirable and declined to take action on the application. When the new commission was formed, briefs were submitted by the States against Federal

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40. Ibid., p. 153.
41. King, Judson, "Opening the Door for the Power Trust", New Republic, Vol. 64 (October 22, 1930), p. 260-1.
King, Judson, "Next Phase of the Power Fight", New Republic, Vol. 65 (Dec. 10, 1930), pp. 91-3.

jurisdiction over non-navigable tributaries, and by the advocates of government regulation in favor of the issuance of a regular license with all the provisions and restrictions of the water power act. The Commission agreed unanimously that the project would affect the interests of interstate commerce, and that the application for a minor-part license should be denied. It ordered that construction of the project should not continue until the company had accepted a standard form license.[42]

The power company brought suit against the Commission in 1931 to prevent the Federal agency from requiring a license, challenging the constitutionality of the act and the propriety of full-license requirements on a non-navigable tributary. The company was defeated in the United States District Court and the Circuit Court of Appeals, and certiorari was denied by the Supreme Court. Both the States and the power industry objected to the outcome of the case.[43] The Company threatened to resume construction of the project without a license. Whereupon, the Commission requested an injunction to require the company to obtain a license before proceeding with the project. This suit is still pending.

Following the example of the Appalachian Power Company, the Union Carbon and Carbide Corporation proceeded to construct a project at Hawks Nest, West Virginia, on the New River, without a federal license, after having submitted to the jurisdiction of the

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42. Eleventh Annual Report of the Commission, pp. 123-5.
43. Editorial, "Federal Power Regulation Passes its First Test in Constitutional Law", Public Utilities Fortnightly, Vol. 11, (April 27, 1933), p. 530-1 and 550-1.
Editorial, "More Power over Power -- Control on Non-navigable Streams", Business Week, April 12, 1933, p. 14.
Ryon, O., "Regulation Moves Upstream; significance of the Supreme Court decision in the New River power case", Public Utilities Fortnightly, Vol. 14 (Aug. 2, 1934), p. 123-9.

Federal Power Commission by filing a declaration of intention. Suit was instituted by the Commission in the Federal District Court. The State of West Virginia, strongly objecting to the extension of Federal power, applied for permission to intervene as party defendant. The Commission accordingly filed an original bill in the Supreme Court against West Virginia, the Union Carbon and Carbide Company and its subsidiaries involved in the construction of the project. This suit was dismissed, however, on the ground that no justiciable controversy existed between the United States and West Virginia. No further action has been taken as yet by the Commission.

The problem of Federal control of non-navigable streams is consequently still undecided, although the decisions of the courts in the Appalachian case indicates that the question of Federal jurisdiction will be viewed liberally. It is unfortunate, however, that Federal control must rest on the basis of navigation, rather than direct control over water power sites. This not only introduces a constant factor of uncertainty, but will tend to keep cases before the courts to circumvent Federal control wherever the stakes are large enough.

Comprehensive development of water resources.

The water power act definitely stated that all projects for which licenses were granted should be in accord with a comprehensive scheme for the improvement and utilization of the river system. Such a scheme would necessarily include the following factors:

1) Complete utilization of the potential power resources at any one site.

2) Coordinated development of the sites in the same stream or watershed to realize the greatest potential power available.

3) The interconnection of hydroelectric projects with steam plants and distributing agencies serving the surrounding territory to achieve the most economical use of the water power.

4) The coordination of water power development with the alternate uses of water and the regulation of the stream flow to realize the greatest social benefits from the water resources.

The first requisite in such comprehensive planning is a thorough and complete investigation of the river system. Unfortunately, however, although the act gave the Commission complete authority to make such investigations and collect and record data concerning the utilization of the water resources of any region to be developed, Congress effectively voided this provision by the failure to provide adequate funds and to permit the Commission to acquire an adequate working organization. Not having any personnel of its own for field investigations, the Commission relied upon surveys made by the Army Engineers, the Reclamation Service and the Geological Survey. This information was incomplete and referred generally to the particular site in question, rather than to the entire river system. In many cases, the information was supplied by the permittees who were, of course, not interested in the potential power of the entire stream or in any other uses of the water. For example, the Aluminum Company of America bought 4,000 square miles of flowage rights on the Little Tennessee River in North Carolina. They spent $250,000 to make a careful study and survey of the particular area in which they were interested, involving a number of power sites. No complete study was made, however, of the river system and the effect of the development of these sites on other sites in which the Aluminum Company had no interest.

In 1924, the Commission stressed the need for comprehensive plans of development. The following quotations are taken from the fourth annual report:

> "In addition to the great desirability of coordinating navigation and power development on all streams where both uses can be had is the necessity of securing the greatest practical utilization of the water power of all our streams. We have no national surplus of water power resources. . . .
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> It is universally recognized that the future of American industry and transportation is dependent upon the use of electrical energy, and that in the production of such energy water power should be used to the full extent of its economic feasibility. If, therefore, we are to develop these powers to the fullest productivity, free of all avoidable waste, and are to secure at the same time the correlated uses of water for navigation, irrigation and other beneficial purposes, we must change from the haphazard methods heretofore employed and proceed to prepare real plans of comprehensive stream development." (p. 7.)

The Commission attempted to prepare such plans through the organization of interdepartmental boards. Studies were made of the Columbia and the Deschutes River in Oregon, and the Trinity, American and Stanislaus Rivers in California. These were not, however, complete or thorough studies of the river systems, and presented merely a rough outline of development.[44] The amendment to the rivers and harbors act of 1925 which provided for an estimate of the costs of surveys necessary to draw up a comprehensive plan of

44. "These studies and reports are useful as far as they go, but adequate plans of river development require more intensive studies, actual surveys of sites, and tentative location of dams and other structures, so that when actual development takes place the full resources of the stream may be utilized not only for power but for every other beneficial purpose. This is the plan which Canada has followed, with the result that its ratio of water power development far exceeds that of the United States. Given adequate authority under the Federal water power act to carry out the program so long advocated, the commission has not been given the means to do so." (Fourth Annual Report of the Commission, p. 8-9.)

river development had the strong support of the Commission, and it recommended at that time that "whatever may prove to be the costs of such surveys, they should be undertaken in order that we may avoid the mistakes in the development of our rivers that will inevitably follow the absense of definite plans."[45] As has previously been stated, these surveys were authorized in the act of 1927, and the work was commenced at once by the Army Engineers. Many licenses had been granted by the Commission, however, before any of these reports were available.[46] The irreparable waste of national wealth which would result from the granting of licenses for the development of the most profitable sites to the first applicants is obvious.[47] The lack of adequate information, however, prevented the formulation of long range plans by the Commission. The policies of the Commission during the period from 1920 to 1930 with regard to the

45. Fifth Annual Report of the Commission, p. 3.
When this amendment was considered in the House in 1925, Representative McDuffie revealed the existing method of granting licenses for power sites and recommended a policy of comprehensive planning, in the following statement: "Instead of going on in a hit-or-miss and slipshod way which has characterized the planting of power dams on our streams for power purposes alone, let us conserve the full use of those streams by developing their potential power in conjunction with navigation, flood control and irrigation. In order to do this the Federal Power Commission and all agree that a careful study should be made of all streams all over the country where power possibilities appear to exist. Power companies are building dams on our navigable streams, but without a survey of the stream as a whole to ascertain its fullest development. Let us then commit the Government to the wise policy of treating our streams with a view of getting the most efficient development of which they are capable." (Congressional Record, Vol. 66, Part 2, p. 1893.)

46. A good example of the need for comprehensive planning in order to realize the fullest benefits from power development is given in the report of the Army Engineers on the Potomac River, H. Doc. 101, 73d Cong., 1st sess.

47. On the report on the Roanoke River, the Engineers reported that there were seventeen available water power sites, considered economically feasible, in the comprehensive plan which provided for the maximum utilization of the water power

various aspects of comprehensive planning can be summarized as follows:

1) Complete utilization of one site.

The Commission would not grant licenses for new projects until assurance was given that the power would be completely developed. Wherever licenses were issued for projects already constructed, however, or for storage reservoirs to augment the water supply of existing plants, there were cases of projects which only partially developed the full power potentialities. In these cases, the Commission attempted to protect the public interest in the site by reserving the right to grant a license for further development of the site by another applicant. The success of such action is, however, questionable.

2) Coordinated development of the sites on the river system.

The surveys made by the Army Engineers of the navigable rivers in the country reported numerous instances of the necessity of developing power sites under unified control in order to realize the full potential power from the river. For example, in regard to the Gasconade River in Missouri, the Board stated that the best plan for the future utilization of the water resources of the Gasconade drainage basin would be the development of the Richland, Arlington, Vienna and Rich Fountain projects as a combined hydroelectric power operation.[48] The extent to which these sites should be under unified control in order to realize the greatest benefits from the development of the river introduces a difficult problem of licensing policy.

(Cont'd) resources of the basin. There were, however, five other sites which would be financially sound, if built without consideration of the maximum economical development of the power of the river system. These alternate projects would be flooded out by the construction of the basic-plan projects. (H. Doc. 65, 74th Cong., 1st sess.)

Should one concern be given an opportunity to develop all the sites, or should they be granted to a number of concerns? This question had been raised at the hearings and debates on the water power bill. Before the bill was passed in 1920, Senator Phipps offered an amendment to the effect that one concern be given the opportunity to develop all the sites on the stream, and gave the following reason:

> "Any company which has had the courage to locate and first develop the power possibilities of a mountain stream should, in my opinion, be given a preference right for securing a license for additional developments on the same stream, and . . . . I have offered an amendment which provides that the party or parties operating or actually engaged in constructing power works on a stream shall have the preferential right to a license for other or secondary power developments on the stream."[49]

The amendment was rejected, however, for fear of fostering a monopoly of the undeveloped sites on a river system, and the act permitted any number of licensees to develop a river. Headwater charges were provided to equalize competitive opportunities. By stabilizing the flow of water with storage reservoirs, one licensee may indirectly greatly augment the value of sites held by other licensees further downstream. The Power Commission, therefore, requires that the licensee so benefited shall reimburse the owner of such reservoir for such part of the annual charges for interest,

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48. Report on the Gasconade River, H. Doc. 192, 72d Cong., 1st sess.

49. Congressional Record, Vol. 59, Part 2, p. 1172.
The West Virginia Water Power Act, passed in 1929, provided for granting all of the water power sites in a watershed to a single licensee. Only the first unit of the development need be completed in order to maintain this monopoly, the rest of the construction taking place in accordance with market needs. (Simonton, J. W., "The West Virginia Water Power Act", West Virginia Law Quarterly, Vol. 37 (Dec., 1930), pp. 1-59.

maintenance and depreciation as it may deem equitable.[50]

The Commission has generally opposed the granting of a number of sites to one applicant, and has adopted the policy of refusing a second license until the first site has been fully developed and the licensee has shown that the market will take the power from the second site. In 1928 Mr. Merrill recommended granting twenty-seven sites on the Cumberland River to the Insull interests. This was the first case in which any such action had ever been favorably recommended, and it brought criticism on the Commission. The fact that the Secretary of War, Mr. Roy O. West, who was suspected of close alliance with the Insull interests, had attended all the hearings on these applications, put the whole situation in a very questionable light. Several formal briefs were filed in complaint, and the incident was frequently cited to prove the close alliance of the Power Commission with the Power Trust.

It is exceedingly difficult to formulate a policy for the co-ordination of power sites on a river under private ownership. The policy of monopoly was generally avoided by the Commission as it feared the power would not be developed. On the other hand, it is very difficult to realize the maximum development of power when the sites are controlled by different private interests. Only by cooperative action among the various private interests can the proper storage facilities be provided. An example of the need for such cooperative action to gain the best development of a river system is given in the report of the Army Engineers on the Menominee River, which flows through Michigan and Wisconsin. After

50. The Public Utility Act of 1935 allows the Commission to exact such charges from all power developments, whether licensees under the Commission or not.

surveying this river system, the Engineers reported that all of the existing power plants except the Sturgeon River and Pine River plants, and all except three of the smallest prospective plants would benefit from the proper use of reservoirs. As stated in the report, however, "as the plants are owned and operated by a number of private concerns, each with interests which would undoubtedly require operation of the reservoirs in a particular manner for its greatest benefit, an agreement between all parties interested would be necessary before use of the reservoirs would be feasible. Such an agreement should provide for operation of the reservoirs in a manner to benefit the greatest number, and should provide for equitable distribution of the costs of construction, maintenance and operation of the reservoirs in proportion to the benefits derived from their use."[51]

3) Interconnections.

There are many cases where hydroelectric power must be combined with steam power to realize the advantages of the water power. For example, wherever there is a high run-off, the hydro power may be used for the base load with steam as a stand-by. If there are storage facilities, the hydro may be used for the peak load. If there are different high water conditions, it is often desirable to have interconnections between different watersheds. If the power is to be for public use, it can generally be most economically developed, and a market can be most readily secured, if it is interconnected with the steam plants and the transmission and distribution systems of the nearby territory. The need for interconnection is indicated in many of the Engineers' reports on the comprehensive

51. Report on the Menominee River, H. Doc. 141, 72d Cong., 1st sess., p. 22.

development of potential water power. The report on the Potomac River assumed that the hydro power would be interconnected and coordinated with the existing power plants and systems. When considering the future development of the power of the Menominee River, The Board stressed the fact that the new hydro power should be operated as part of a system.

> "If the power at the remaining sites on this river is to be developed to successfully compete with steam power the new plants will necessarily be operated as part of a system including the existing hydro and steam plants now serving the communities located within economical transmission distance of the river. Only by such unified control can the use of water and the generation of power be coordinated in the most advantageous manner."[52]

At the hearings on the water power bill, Mr. Merrill had expressed a belief that it would allow the Commission to require such interconnections by the licensees. No specific provision was made in the act, however, to permit the Commission to force interconnections and the provisions for "the most comprehensive development" were not interpreted in that manner. The Commission required that all applicants submit information as to the other sources of power with which the project would be operated, and stated that consideration would be given to the factor as to whether "proper provision is made for present and future electrical interconnections with other projects or systems."[53] In a study of the policies of the Federal Power Commission, Lester V. Plum makes the following statement in regard to this problem of interconnections:

> "Certain permits have been granted only after the applicant has submitted evidence of his ability to arrange for the operation of the project in connection with steam plants of suitable capacity, and in cases of conflicting applications preference has been granted to the "going concern" because of the comprehensive power system controlled by it. Even in the case of an

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53. Report on the Menominee River, op. cit., p. 23-4.

independent development of a site for industrial purposes, the licensee may be required, before beginning construction, to submit plans for future electrical interconnection with the adjacent power transmission systems, if found desirable by the Commission."54

Mr. Plum indicates, however, that these attempts have been very feeble and that the utilities and holding companies do not appear to have suffered any restraint in their activities.

4) Relation of water power to other uses of water.

As has been stated, the lack of funds and a field organization prevented the Commission from making complete surveys of the river systems under its jurisdiction. The law directed, however, that navigation must be considered before granting any licenses. Furthermore, cases arose where the use of particular sites for power development were so closely related to other uses of water that they had to be considered before granting a license.

All plans for projects on navigable streams were submitted to the Chief of Engineers for recommendations as to the necessary facilities for navigation purposes. The Commission adopted the policy of requiring the actual construction of facilities by licensees at their own cost wherever they were deemed economically justified at that time. In all cases where the river was not used for water transportation, no demands were made of the licensees. The Commission clearly defined its position in this regard in its fourth annual report, stating that "the construction of locks far in advance of their probable use would be a waste of capital, whoever might supply it. Furthermore, it may be doubted if the cost of purely navigation structures in a stream which has only a prospective use for transportation should be charged against the users of power

54. Plum, Lester V., The Federal Power Commission, p. 249.

therefrom. It appears more appropriate to charge the cost of such structures against the general public benefited thereby in accordance with the practice hitherto pursued." (p. 7.)

In regard to the relation of power to irrigation, one of the first problems to confront the Commission was the Deschutes River in Oregon. Practically all of the water of the upper section of this stream was used or usable for irrigation, which necessitated the formulation of a definite policy with respect to the future development of the river for water power and irrigation. A survey was made under the direction of the Federal Power Commission by an interdepartmental board consisting of D. C. Henny, an engineer in the Reclamation Service, J. B.Cavanaugh, of the Army Engineers, and Fred F. Henshaw, of the United States Geological Survey. This report, submitted on September 6, 1921, recommended that the river be cut in two at a point known as Odin Falls, fifteen miles north of Bend; the waters of the upper river to be devoted exclusively to irrigation and the lower river to power. This policy was adopted by the Power Commission and the State of Oregon.

In all of the arid Western States, water for irrigation is considered a more important use than for power. The waters of the entire Platte Basin, for instance, are primarily dedicated to irrigation usage by State laws. There are, therefore, no possibilities of development strictly for the purpose of power production without consideration of the water usage of existing irrigation projects, possible extensions thereto, or possible new projects to be developed in the future. When the Engineers examined the river, potential water power development was divided into two classes: (1) those developments that would not interfere with irrigation; and (2) de-

velopments that could be operated in harmony with both existing and potential irrigation requirements.[55]

Inasmuch as the Federal water power licensees must first have fully complied with the laws of the State in which the project is located, the States may impose any restrictions deemed necessary to protect vested interests in the water and for potential irrigation purposes. Wherever there was a possibility of conflict between water power and irrigation, the Commission included the provision in the license that the use of the water for purposes of generating power must be subordinate to irrigation usage.[56] If the two were not reconcilable, the application for power development was rejected.[57]

In a few cases, requests have been received by the Commission that certain applications for power projects be denied on the ground that the area involved should be reserved exclusively for recreation purposes. These protests have come primarily from the business interests in the district who feared the loss of tourist trade. In one case, that of Spirit Lake in Washington, the Commission denied the application for the power development on the grounds that the area was at present too valuable for recreational purposes, and that there was no evidence of local demand for the power.[58] In a number of other cases, the Commission has attempted to reconcile the two

55. Report on Platte River, H. Doc. 197, 73d Cong., 2d sess.
56. See provisions in the license granted Frank G. Baum for a project on the Black River to protect the interests of the Salt River Valley Water Users' Association, Project No. 91, in Third Annual Report of theCommission, p. 70; the license to Harry V. Gates, Project No. 669, on the Crooked River in Oregon, Ibid., p. 100; the license to the Washington Electric Company, Project No. 943, Tenth Annual Report of the Commission, p. 71; and the terms of the preliminary permit to the Utah Power and Light Company on the Green River, Project No. 165, Third Annual Report of the Commission, p. 192.
57. See the action of the Commission on the Losse application for a project on the East Walker River, Nevada, Ibid., p. 92.
58. Second Annual Report of the Commission, p. 145.

interests. A good example is that of Lake Chelan in Washington. In order to develop the power, the applicant proposed to vary the level of the water by twenty-one feet. In an attempt to reconcile power development with recreation, the Commission required that the submerged shore line must be cleared, and that the lake level must be maintained at approximately the maximum during the tourist season from June 15th to September 15th.[59]

An informal opinion was rendered by the Attorney-General in 1929, with specific reference to the Cumberland Falls project, that the Commission was without authority to refuse the issuance of a license on the ground that the scenic beauty or recreational advantages of the site must be preserved. This opinion was not accepted by the Commission, although doubt was later expressed by the Commission with regard to this question.[60] The Public Utility Act of 1935 amends the section on comprehensive development to definitely include uses of water for recreational purposes.

Licensing Policy.

Prior to the passage of the act, projects involving some 1,400,000 horsepower had been constructed under authority given by the Federal Government. Of this total, 800,000 horsepower was located on public lands and reservations, 200,000 horsepower on boundary streams, and the remaining 400,000 horsepower on the interior navigable rivers. Of the latter amount, only slightly more than 60,000 horsepower had been developed after 1906. The Commission stated in its first annual report that "the rights granted (under the Federal laws prior to 1920) were so insecure and the liabilities im-

59. Sixth Annual Report of the Commission, p. 10-11.
60. Twelfth Annual Report of the Commission, p. 8.

posed are so uncertain that only in occasional instances could water power developments which required Federal authority be financed; with the result that the development of the inexhaustible water power resources was largely blocked and recourse was had to steam power with its consequent use of coal. The flood of applications which has followed the passage of the act of 1920 and the projects on which, notwithstanding the industrial depression and the uncertain financial situation, construction has already started under license issued by the Federal Power Commission is abundant evidence both of the extent to which former legislation stood in the way of power development, and of the general satisfactory character of the present legislation."[61] This statement reveals the attitude of the Power Commission, which is repeated in many of their reports, that the purpose of the water power act was to stimulate the immediate development of the potential water power in the country. This assumption has been the determining element in the formulation of licensing policy.

In order to realize immediate development of the site, and to be assured that the potential power will be fully developed as soon as possible, the following requirements are necessary:

1) That the applicant can meet the legal requirements of the State in which the project is located to develop the site and use or sell the power.

2) That the applicant is financially able to fully develop the site.

3) That a market for the power is assured.

These requirements have, accordingly, been accepted by the

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61. First Annual Report of the Commission, p. 5.

Commission, and the choice between conflicting applications has been primarily on the grounds of financial ability and the existence of a market for the power. The preference has, consequently, been given to the going public utility corporation serving the surrounding territory. These companies had full legal authority to develop the site, ample financial backing, and an assured market for the power. They had only to obtain the express consent of the State to use the water and to draw up drafts of construction plans in order to receive a preliminary permit. Inasmuch as the law specifically gave the permittees priority for a license, the going concern had little or no difficulty in securing the sites it desired.

The fact that the applicant was a member of a large holding company system has been to its advantage for it assured the Commission that there was reliable financial backing for the projects. For example, the Washington Irrigation and Development Company, a subsidiary of the American Power and Light Company of the Electric Bond and Share system, applied for a license at Priest Rapids on the Columbia River. The Commission stated "that the applicant's financial standing is such as to enable it to undertake the development" and specific reference was made to its holding company affiliation.[62] This financial backing was apparently the principal factor in granting the license, for the territory adjacent to the project was largely undeveloped and a market for the power had to be built up.

The preference for that applicant who would immediately develop the power is illustrated in the decision of the Commission with regard to a conflict of applications for a site on the Mississippi

62. Fifth Annual Report of the Commission, p. 93.

River between the Northern States Power Company and the St. Cloud Public Service Company. An investigation was made of the situation and the executive secretary reported that the St. Cloud Company had immediate need for the additional power to take care of its growing load, and if granted a permit the company would immediately proceed to develop the site. The Northern States Power Company, on the other hand, was looking ahead for a number of years and would not begin construction at once. The preference was, therefore, granted to the St. Cloud Company.[63]

Wherever the applicants have proposed to use the power for their own manufacturing purposes, the Commission has required assurance that the power will be fully developed and, if not all used by the applicant, the surplus shall be sold. For example, a preliminary permit was granted the Ford Motor Company for the development of power at the Government dam between St. Paul and Minneapolis, subject to the condition that the Company should submit, before the granting of the license, executed contracts providing for the sale, delivery and use of all surplus power not needed for said company's manufacturing operations.[64]

A very good illustration of the licensing policy of the Commission is the decision between the conflicting applications between the Little Falls Water Power Company and the Pike Rapids Power Company for a project on the upper Mississippi River. The Commission found that both companies were willing to meet any requirements made by the Secretary of War for navigation purposes. Furthermore, both parties were unquestionably able to finance their

63. Second Annual Report of the Commission, p. 146.
64. Third Annual Report of the Commission, p. 129.

projects and to market the power to be made available by their construction. The Pike Rapids Power Company owned or held the flowage rights covering about 80% of the land necessary in the development of its project, whereas the Little Falls Water Power Company controlled only that land adjacent to its two dam sites. The latter company, however, was a going concern with a transmission system supplying Little Falls and adjacent towns and connecting with the system of the Cayuna Range Power Company. The Pike Rapids Company, on the other hand, was not a going concern, and according to the report of the case, would have to market its power by selling wholesale to nearby distributing companies, and to factories and mines in the vicinity where the loads were large enough to warrant the construction of branch transmission lines. The question, therefore, resolved itself into the relative weights to be attached to the property rights of the Pike Rapids Power Company and the fact that the Little Falls Company was a going concern operating in the region. After considering the matter, the Commission deemed it "more conducive to the public interest that additional power when needed by supplied by existing agencies having operating properties and an established market rather than by new organizations which would be required to develop properties and establish a market."[65] The permit was accordingly granted to the Little Falls Power Company.

This policy of the Commission to give preference to the going concern was subjected to widespread criticism in connection with the leasing of the Flathead site in Montana. The Rocky Mountain Power Company, a subsidiary of the Montana Power Company, applied for the

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65. Third Annual Report of the Commission, p. 130-1.

site to develop it as a part of its comprehensive power system. Walter H. Wheeler, of Minneapolis, also applied for a permit, and proposed to use the power for the development of electrochemical and electrometallurgical industries at or near the power plants. At the hearings on the applications, Mr. Wheeler likened the Flathead site to Muscle Shoals. He intended to develop the power for the manufacture of fertilizer and advocated the development of the site as a competitive "yardstick". The power company, on the other hand, insisted upon the need for operating the site as a part of their power system for which there was an established market. The power company had a virtual monopoly of all the other power sites in the region, both developed and undeveloped. The Commission stated, however, that the power company had "made satisfactory showing as to market and ability to finance the project", whereas Mr. Wheeler had "made no conclusive showing that he can successfully market the power if authorization for the developments were granted him."[66] The case was a complicated one, and it cannot be said definitely on just what grounds the decision was made. It was widely publicized, however, and the Commission was criticized for its decision in the case.[67]

Although the water power act stated that preference should be given to municipalities in the issuance of permits and licenses, the Commission has required them to submit the same qualifications as

66. Tenth Annual Report of the Commission, p. 114.
67. Soule, "War in the Power Commission, New Republic, Vol. 62, (March 5, 1930), p. 67-9.
Collier, "The Flathead Water Power Lease", New Republic, Vol. 64, (August 20, 1930), p. 20-1.
Editorial, "Flathead - A Power Yardstick", New Republic, Vol. 63, (June 11, 1930), p. 86-7.
Editorial, "The Power Trust and the Indians", Nation, Vol. 130, p. 440.

to financial ability, available market and comprehensive development. The municipalities have, accordingly, had little chance of competing with the public utility corporations serving that territory. The municipality could seldom give assurance of complete development of the site for it could not coordinate the hydro plant with a widespread power system as could the private companies. In many cases the municipalities were unable to show financial ability to undertake the development because of statutory limitations on their bonded indebtedness. Inability to acquire land by condemnation and to sell power outside the city limits further prevented the municipalities from developing water power sites. A good example of the disadvantages of the municipality when competing with a private enterprise for a permit is the case of Louisville, Kentucky. The city and the Louisville Hydro Electric Company had both applied for permits to develop the power at the Government dam at Louisville. The chief engineer reported that the water power project would furnish only secondary power and that the "only feasible scheme of development at present is in conjunction with the entire public utility load of the region using the existing steam plants as reserve."[68] He further stated that the city of Louisville was not competent "on account of the limit imposed by the State constitution upon the indebtedness which it can incur, to undertake a project that would be in accord with the best scheme of development." The site was granted to the private company. By adopting the policy that the site must be interconnected with power systems to provide for the comprehensive development of the site, and that no preference shall be given to a municipality for the

68. Fourth Annual Report of the Commission, p. 59.

wholesale distribution of power outside the city, the provisions for municipal preference has been practically ineffective.

The nature of the proposed use of the power, whether for private manufacturing or public utility purposes, has never been a deciding factor in the issuance of licenses as long as assurances were made by the applicant that the site would be fully developed. In an article in the Manufacturers' Record, Major Edgarton, then chief engineer of the Commission, stated that superior merit in the public service has sometimes been urged for public utility use over direct industrial application, and the contrary contention has been advanced.[69] No ruling on this question has been made by the Commission. A review of the decisions by the Commission with regard to this matter, however, indicates that the Commission has followed the policy of acting in accord with local opinion.[70]

Regulation of licensees.

The conservationists had considered the provisions for recapture one of the most important factors of government control and succeeded in securing the provision in the act that the projects

69. Edgarton, op. cit.
70. For example, in the conflict between the Northern States Power Company and Henry Ford for a development of power at the Government dam at Minneapolis, the Commission decided in favor of the Ford application and stated in its decision, "the application of the Ford Motor Company is supported by the mayor and other officials of St. Paul, by the Minnesota Farm Bureau Federation, by the labor organizations, and by commercial organizations of St. Paul and Minneapolis. The support of the Ford application is based upon the belief that if Mr. Ford gets this power he will establish a large manufacturing plant near the dam to convert the iron ore of Minnesota into automobiles and tractors, and that the power will be of greater benefit to the community if used to develop this industry than if used for other purposes." (Third Annual Report of the Commission, p. 128.)

could be recovered at the expiration of the license at the original net investment cost plus severence damages. In order to make this provision effective, however, it is necessary to maintain strict regulation of the accounting practices of licensees. A system of accounts was adopted by the Commission in 1922, but inasmuch as a large proportion of the licensees were public utility corporations operating in States having regulatory commissions with some authority to regulate accounting practices, the Power Commission did not require these licensees to maintain its system of accounts. The only requirement with regard to these licensees was that they submit certain prescribed statements and reports. They were, furthermore, exempted from the provisions as to depreciation reserves, wherever the States had requirements which differed from those of the Power Commission. The actual supervision of accounts, therefore, has been left to the State commissions for most of the Federal licensees. The failure to exercise current supervision over accounts will make any attempts to recapture the sites exceedingly difficult, and will probably necessitate engineering estimates. The provisions for severence damages will also increase the problems of recapture.

Wherever applications were made for projects already constructed the Commission was to determine the original net investment, the statement of which would be included in the license. The lack of funds and a personnel capable of making these valuations forced the Commission to adopt the policy of granting licenses for these projects with the provision that a valuation would be made at a later date. The Commission attempted to make some of these valuations with its limited force, but found the task an impossible one.

The water power act provided that the Commission should regulate the rates charged by its licensees wherever the states made no attempt to do so or if the licensees were engaged in interstate commerce. Inasmuch as the States all had regulatory commissions, with some degree of control over the rate structures of the public service corporations, the Power Commission considered that the requirements of the act were being fulfilled by state regulation.[71] The Commission made no attempt to regulate the rates of its licensees when such power was sold wholesale in other States. The provisions for rate regulation apparently contemplated that the water power projects would be operated singly and that all the power sold by the licensee would be generated from the project. Actually, this was not so. In many cases, the power was sold to an affiliated concern, which company also generated or bought steam power, and the rates charged its customers were in no event based upon the cost of producing either type of power separately. In other cases, the hydro plant was operated as an integral part of an interconnected power system. The failure to foresee that this would be the case was probably one of the greatest errors in the formulation of policy in the water power act, for it rendered all the provisions regarding the regulation of rates, services, and securities, and the expropriation of excessive profits utterly useless. Any attempts at enforcement would have been futile.

Investigation and Reorganization of the Commission

There was constant criticism throughout this period of the policies of the Power Commission. In particular, the Commission was severely criticized for "giving away" water power sites to the

71. See the Eighth Annual Report of the Commission, p. 11-12.

big corporations as rapidly as possible. The action of the Commission with regard to the application of the Insull interests for most of the sites on the Cumberland River; the granting of the Flathead site to a subsidiary of the Electric Bond and Share, which company already had a monopoly of the sites in that section of the country; the granting of a license for a project at Cumberland Falls to a private power company, although the State of Kentucky had requested that no action be taken in order to preserve the beauty of the Falls; and the refusal of the Commission to institute proceedings against the Appalachian Power Company for operating without a license increased the antagonism toward the Commission. During 1929 internal dissension arose within the ranks of the Commission, and the legal advice of the solicitor and the accounting advice of the chief accountant were disregarded by the executive secretary, F. E. Bonner. Also in 1929, a confidential memorandum regarding the Power Commission, which was generally considered to have been the work of the National Electric Light Association, was published in the newspapers, and led to a Senate investigation of the difficulties within the Commission and the rumors of connivance between the Commission and the power interests.[72] This investigation revealed that the Secretaries of the Departments had not had the time to make adequate studies of the problems confronting the Commission. The reports indicated that the three Cabinet officers had devoted an average of 5½ hours per year to the meetings of the Power Commission.

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72. This memorandum was entitled "The Federal Water Power Act and its Administration - A Summary with Suggestions", was written just prior to Mr. Merrill's resignation from the Commission in 1929, and indicated the extent of the influence exercised by the power interests over the Federal regulatory agency.

A number of bills were immediately introduced, providing for the creation of a full-time commission and an adequate personnel, and for an extension of jurisdiction as recommended by the President at the opening of the session to include all interstate power transactions.[73] The complexities of the latter problem and the objections to the policy of federal regulation of rates forced Congress to restrict its attention solely to the reorganization problem. The Senate bill provided for three commissioners,[74] whereas the House favored five.[75] During the debates in the House, one of the reasons given for five commissioners was the belief that the duties of the Commission would be gradually extended. There was, of course, the usual objection to bureaucratic power but it was given little consideration. The House was victorious, and the act was approved on June 23, 1930, providing for the appointment of five full-time commissioners to be appointed by the President and approved by Senate. It also provided for the establishment of an adequate personnel to handle the work of the Commission.

Development of Policy, 1930-1936

The reorganized Commission had the advantage of an adequate personnel which enabled it to give immediate attention to applications and to consider in more detail the problems of construction and prelicense costs. In addition, the extensive investigations which had been made by the Army Engineers were helpful to the

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(Cont'd) A copy of this paper is included in the hearings before the Senate Committee on Interstate Commerce on S. Res. 80, 71st Cong., 2d sess.

73. S. 3619, 3869, H. R. 11408, 19650, 71st Cong., 2d sess. Motions were also made to prohibit the issuance of further licenses by the Commission, S. J. Res. 181, H. J. Res. 342, 71st Cong., 2d sess.

74. Sen. Report 378, 71st Cong., 2d sess.

75. H. Report 1793, 71st Cong., 2d sess.

Commission in complying with the provisions for comprehensive development. The new Commission has been more liberal in granting licenses for projects with the expectation of the development of a market. With this general exception, however, there has been little change in administrative policy.

The most significant aspects of this period have been the realization of the need to consider water power in connection with the electric power industry and the attempts to extend the activities of the Commission. The subject of electric power and the development of national power policy is outside the scope of this study, which is concerned with water power as one aspect of the use of water resources and the correlation of water power with other uses of water resources. If water power licensees are to be regulated, however, and the best use is to be made of the water power sites, it is necessary to consider the interrelationship between water power and the electrical industry as a whole. For this reason, the extension of the activities and jurisdiction of the Federal Power Commission during this period will be briefly considered.

The first report of the reorganized commission stressed the need for considering conditions and problems of the general power industry, the relation of the holding company to its operating subsidiaries, the increasing amount of interstate transfers of power, and the need for information as to the present status of the power industry.[76] The Commission also stressed the need for greater publicity, not only for public education but also as an effective method of regulation. Shortly after its organization and assumption of duties, the Commission undertook a study of the holding company affiliations of

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76. Eleventh Annual Report of the Commission.

its licensees to determine the effect of such applications on the activities of the licensees which were under the jurisdiction of the Commission.

During the past three years, under the active direction of President Roosevelt, both the activities and jurisdiction of the Commission have been increased. In 1933 the President designated the Commission as an agency to aid the Federal Emergency Administrator of Public Works in the preparation of that part of a program of public works pertaining to the development of water power and the transmission of electrical energy. By this order the Commission was directed to make "a survey of the water resources of the United States as they relate to the conservation, development, control and utilization of water power; of the relation of water power to other industries and to interstate and foreign commerce; and of the transmission of electrical energy in the United States and its distribution to consumers."[77] In accordance with this order, the Commission made an investigation, covering descriptions of plants of private companies and municipal agencies, transmission lines, undeveloped power sites, interstate transfers, load curves and other necessary data for the formulation of national power policy.[78] At the direction of Congress, a survey was made of the rates charged for electrical energy throughout the country by both private and municipal corporations.[79] A survey was also made of the cost of electrical distribution in representative communities, including both privately and publicly operated systems.[79]

77. Executive Order No. 6251, August 19, 1933.
78. National Power Survey, 1935.
79. Rate Survey Series, 1935.
80. The nature of these surveys and their importance as a basis for Federal regulation and policy is discussed in the Fourteenth Annual Report of the Commission, p. 6-13.

On July 16, 1934, President Roosevelt established in the Public Works Administration the National Power Policy Committee.[81] The President stated that the purpose and duties of this committee were to be as follows:

> "I wish to establish in the Public Works Administration a committee to be called the 'National Power Policy Committee'. Its duties will be to develop a plan for the closer cooperation of the several factors in our electrical power supply -- both public and private -- whereby national policy in power matters may be unified and electricity be made more broadly available at cheaper rates to industry, to domestic and, particularly, to agricultural consumers. Several agencies of the government, such as the Federal Power and Trade Commission, have in process surveys and reports useful in this connection. The Mississippi Valley Committee of Public Works is making studies of the feasibility of power in connection with water storage, flood control and navigation projects. The War Department and the Bureau of Reclamation have under construction great hydro-electric plants. Representatives of these agencies have been asked to serve on the committee. It is not to be merely a fact-finding body, but rather one of the development and unification of national power policy."[82]

This committee has acted in an advisory capacity to the President, and played an important part in the drafting of the Wheeler-Rayburn bill for the Federal regulation of public utility holding companies and interstate activities of the power companies. Title II of this bill proposed to amend the water power act by giving the Power Commission broad powers over the transmission and sale of electrical energy in interstate commerce. The important

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81. Secretary of the Interior Ickes was named chairman of the Committee, and the following members were appointed: Dr. Elwood Mead of the Bureau of Reclamation; Frank R. McNinch, Chairman of the Federal Power Commission; Morris L. Cooke, of the Mississippi Valley Committee; Major Gen. Edward M. Markham, Chief of Engineers of the War Department; Robert E. Healy, of the Federal Stock Exchange Commission; David E. Lilienthal, of the Tennessee Valley Authority; and T. W. Norcross, Assistant Forester of the Forest Service. Since the creation of this committee many changes have been made in its personnel.

82. Congressional Digest, Vol. 13, (October, 1934), p. 237.

features of this section of the bill are as follows:[83]

1) Regional planning.

"The Commission shall have the power to establish regional districts for the control of the production and transmission of electric energy, including interchange of energy, interconnection of facilities, and determination of the use to be made of the facilities in such districts."[84] All terms and conditions of the arrangement for the interchange of power and the use of power facilities by several individuals shall be made by the Commission, including the apportionment of cost between them and the compensation reasonably due to any of them. Furthermore, no public utility shall undertake any construction or extension of facilities subject to the jurisdiction of the Commission until receiving the express consent of the Commission. No such facilities shall be abandoned, sold or leased without authority from the Commission. The purpose of this control shall be "to secure an abundant supply of power with the greatest possible economy and the proper utilization and conservation of national resources."

The power of the control embodied in this section would have been sufficient to effect great changes in the production and transmission of power -- the establishment of completely interconnected regions, and the use to be made of the plants within the region, which would allow the desirable coordination between hydro and steam plants, and the privately and publicly operated facilities in and between such districts.

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83. S. 1725, 74th Cong., 1st sess.
84. Sec. 203 (a).

2) Securities.

No public utility under the jurisdiction of the Commission shall acquire the securities of another public utility, or issue any securities or assume any obligations without order from the Commission. The exact purpose for which funds shall be used shall be stated in the order of the Commission.

3) Rates.

All rate schedules shall be filed with the Commission and be given adequate publicity. There shall be no unreasonable difference in rates as between customers or localities, or different classes of service. No change shall be made in published rate schedules except by consent of the Commission. Either upon complaint, or on its own initiative, the Commission may investigate the propriety of the rate schedules and order any changes deemed necessary to protect the public interest. "In determining just and reasonable rates, the Commission shall fix such rate as will allow a fair return upon the actual legitimate prudent cost of the property used and useful for the service in question."[85]

The Commission may refer any matter arising in the administration of these provisions to a board representing the State or States affected in the matter. This board shall be appointed by the Power Commission from persons nominated by the State commissions. The Commission shall also secure and keep current information regarding the ownership, operation, management and control of all facilities for the generation, transmission and distribution of electrical energy; the capacity of output; the cost of operation; and the rates and contracts with respect to the sale of power; and the relation of

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85. Sec. 211 (e).

all such facts to the development of navigation, industry, commerce and the national defense.

In the final bill as approved by Congress and the President, the provisions of Title II, which is known as the Federal Power Act, with respect to the regulation of rates for wholesale distribution of power in interstate commerce, the securities of the companies engaged in interstate commerce, mergers, the acquisition of property, and the collection of information were essentially as indicated above. In an address before the Institute of Public Affairs, Basil Manly, of the Power Commission, stated that the provision for establishment of a clearing house of information regarding all phases of the electrical industry was "perhaps the most important and constructive provision in the Act."[86] Prior to this time, the only information on the industry compiled by the Federal Government had been the five year Census of Central Electric Stations and monthly bulletins regarding electric plant capacity and output.

The most important provision in the bill, however, was that relating to interconnections and regional planning. This is not only essential to the future economical production and widespread use of electrical energy, but it is also a very important aspect of the development of water resources and multiple purpose projects. The need for interconnected systems in relation to the development of water power is indicated in the report of the Mississippi Valley Committee as follows:

> "The production and distribution of electricity, more than most other factors, demands Valley-wide coordination as part of a unified national system. The opportunities for power development are great, out of a potential of 16,000,000 Kilowatts on the Mississippi and its tributaries only 2,000,000 have so far been utilized. In cases where

86. Address of July 16, 1936, Federal Power Commission News Release No. 95.

potential power is not near an existing market a region-wide tie-up -- an electrical pool to which all power resources would contribute -- would often make it economically feasible to develop. In any such combination there would be a residue of continuous power, even when many individual plants were contributing only a part of the time.

If coordination is taken as the key we see the unfortunate effects of the present set-up in a power map which shows a 'crazy patchwork of operating areas' and 'a mass of independent unrelated generating units'. Congested areas have more installed power than their inhabitants can utilize under present conditions; other areas, especially the rural ones, have little or no electric service, and there is a general underconsumption of power. The Federal Government should regulate transmission, regardless of the number of generating plants or transmission lines it may ultimately own. During the next twenty years it could profitably spend a billion dollars on river works in the Mississippi Valley, half of which would be for self-liquidating power installations. With this nucleus it would experiment as well as regulate."[87]

Unfortunately, however, the provisions of the original bill for regional districts were radically changed and rendered ineffective. The provisions in the act are as follows:

"The Commission is empowered and directed to divide the country into regional districts for the voluntary interconnection and coordination of facilities for the generation, transmission, and sale of electric energy, and it may at any time thereafter, upon its own motion or upon application, make such modifications thereof as in its judgment will promote the public interest. Each such district shall embrace an area which, in the judgment of the Commission, can economically be served by such interconnected and coordinated electric facilities. It shall be the duty of the Commission to promote and encourage such interconnection and coordination within such districts and between such districts. Before establishing any such district and fixing or modifying the boundaries thereof the Commission shall give notice to the State commission of each State situated wholly or in part within such district, and shall afford such State commission reasonable opportunity to present its views and recommendations. . . .

Either upon application from the State Commission or the public utility itself, the Commission may direct physical connections between the facilities of two or more individuals engaged in the business, if the Commission finds that no undue burden will be placed upon such public utility thereby. Furthermore, the Commission shall have no authority to compel the enlargement of generating facilities for such pur-

87. Report of the Mississippi Valley Committee, 1934, p. 4-5.

poses, nor to compel such public utility to sell or exchange energy when to do so would impair its ability to render adequate service to its customers."[88]

In an address at Northwestern University, Commissioner Seavey stated that the purpose of the provisions for interconnection and coordination were to assure an abundant supply of electric energy with the greatest possible economy and with regard to the proper utilization of national resources.[89] On June 6, 1936, the Commission adopted an order tentatively dividing the country into regional power districts, which was submitted to the State Commissions for their views and recommendations. At the present time the Commission is making detailed studies of these districts to determine the present facilities, the existing loads of each area, the probable future power requirements, the undeveloped resources of each region, and the proper method of operating these facilities to receive the most beneficial and economical use thereof. As stated by Commissioner Seavey:

> "The study for each district is for the purpose of making available a comprehensive and rational presentation of the system operations that may be possible when the district is treated as a unit. In fact it will be a pro forma set-up and visualization of the operations to be realized when the several independent existing utility services within the territory may voluntarily enter into agreements to merge their several separate markets and generating systems serving them so as to pool the entire power resources of the region under a central load dispatching agency with authority to order operation of the most efficient plants and shut down inefficient ones when they are not needed for peak loads or for emergency operations."

The relation of the unified operation of the power industry to water power development and to multiple purpose projects generating

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88. 49 Stat. 847, Sec. 202.
89. Address before the Evening Course of the School of Commerce, January 11, 1937.

power is clearly indicated by the Commissioner:

> "Coordination of existing facilities to serve present loads may produce some savings, especially where hydro plants are involved, and greater use of water power is thus encouraged. The greatest value of regional power pooling will come with any growth of the load in the district making necessary the installation of additional generating and transmission facilities. With the system of power pooling these can be planned for the best interests of the area, developing water power if it is more economic, or installing additions to existing plants, or constructing new steam power plants at sites where fuel can be had at attractive prices and where water required for condensers will be available, such plants being located as near as practicable to the load center for the district. These new facilities when operated with the most efficient existing facilities to serve the probable future loads under a carefully planned system of load dispatching, should furnish not only the most economic power supply for the area but should also furnish the most reliable service.
>
> Regional power pooling must of course make possible the utilization of power from Government or Public Works projects, constructed in connection with navigation, flood control, and the use of surplus hydro energy produced in connection with the irrigation projects.
>
> When hydro energy is involved the use of stream flow and storage must be considered in connection with the other large uses of water such as flood control, navigation and irrigation and perhaps while it is relatively small in quantity, the highest use, that for domestic purposes, may need special consideration. Particularly in the great semi-arid area of the West where water stored in artificial reservoirs in the mountains is the life blood of the communities, will these problems become more and more acute as social and commercial development advances."

The studies made by the Commission with regard to the establishment of regional power districts will be very helpful in the formulation of future policy, but it is probable that the only result of the provisions of the Power Act will be that those interconnections will be made which are considered profitable by the utility company. In all other cases, the Commission will have to bear the burden of proof that interconnections would not be an undue burden on the utility or impair its ability to render adequate service. It can be expected that any action on the part of the State commissions or the

Federal Power Commission would immediately throw the whole matter into the courts, where the state or federal agencies would have little chance of winning their case. Before a grid system such as outlined in the address of the Commissioner can be established, it will be necessary to give the Power Commission, or some other Federal agency, adequate authority to compel the joint use of facilities, to control the construction of new facilities, and the abandonment of existing plants and equipment, and to establish a central authority to direct the operations of the system. Under our present regulatory system, but little cooperation can be expected from the private utilities. Moreover, the state commissions will seriously obstruct any movement toward centralization of control over the power industry in a Federal agency.

Summary.

The Federal Water Power Act was the result of a long, bitter fight between the conservationists, who demanded that the resources of the country be protected and developed in the interests of the public welfare, and the private power interests, who wished to control and exploit water power sites without restriction to realize the maximum monopolistic profits. The power group found allies in the States' rights advocates and in the Southern and Western states, wherein most of the undeveloped sites were situated. The argument of unconstitutionality of Federal control played an important role in delaying Federal action, and is a question which is still undecided.

The water power act was decidedly a compromise which, as administered by the Power Commission, has favored the private utility interests. The lack of an adequate personnel and funds prevented

the Commission from making the necessary studies of river systems and from carrying out the provisions for accounting supervision and the determination of prelicense costs under the recapture provisions. The regulation of rates, securities and services was left entirely to the State regulatory bodies. The provisions for comprehensive development of rivers was practically ineffective. The Commission attempted to secure complete development of individual sites, but no plans were formulated for the complete development of the river to obtain the maximum potential power, or for the coordination of power development with other uses of water or existing power systems. With the ideal of immediate development of water resources, the criteria for granting licenses has been financial responsibility and the ability to find an immediate market for the power. The public service corporations operating in the vicinity, with existing power facilities and an established market, were, accordingly, given preference over all other applicants, including the municipalities. The opposition to private exploitation of power sites for immediate profit, which had resulted in the Water Power Act, continued to oppose the operation of the act under the Power Commission, and blocked every attempt to grant sites on the Tennessee, the Colorado, the St. Lawrence, and the upper Columbia Rivers.

Under the Roosevelt administration, the activities and jurisdiction of the Power Commission have been greatly extended. Although the provisions of the Federal Power Act will probably be very ineffective, so far as curbing the monopoly power of the electric utilities or establishing regional, interconnected power systems, the recognition that these problems are national in scope and that the development of water power is inseparably related to the

electric power industry as a whole is highly significant. There are but a few instances where water power sites have been developed and operated singly for public service purposes. In most cases, it is necessary to operate hydro plants as a series or in conjunction with steam plants. The future of water power development depends upon the possibilities of connecting these plants with a comprehensive, interconnected power system. The studies which are being made by the Commission at the present time, therefore, are essential as a foundation for the formulation of national power policy and the proper development of water resources.

CHAPTER V.

THE COORDINATED DEVELOPMENT OF WATER RESOURCES

The Results of the Uncoordinated Use of Water and Land Resources

The outstanding characteristic of national policy prior to 1930 with respect to the improvement of rivers for water transportation, the control of floods, the irrigation of agricultural lands and the development of water power, was the tacit acceptance of the principles of free private enterprise as the fundamental basis of our economic society and the identification of commercial economy with political economy. The ideal of laissez-faire is so well-known that there is no need to dwell on it at any length. The theoretical conception of the competitive system as originally enunciated by Adam Smith is the essence of simplicity, automatically directed and controlled to function in the interests of society. The activities of individuals within the group, in their various capacities as producers, consumers and laborers, are unrestricted. Complete freedom of enterprise, so the argument runs, is the only means of obtaining the maximum satisfaction of desires at the minimum cost. The restraining force, which compels enterprisers to act in the interests of others, is competition, and the guide to all economic activity is profit. In such a system, the government plays a negative role. Its functions would include national defense, the maintenance of law and order, the protection of property and the right of contract, and the prevention of violence and fraud. In other words, the role of the government is to protect and encourage private enterprise.

The theory of free private enterprise had its origin in the mer-

cantilistic period of strict governmental regulation of industry and commerce. It was advocated as a means of increasing the material wealth of the country, and thereby contributing to the public welfare. The theory was immediately accepted by business men as the ideal organization of society. The general prosperity and increase of wealth in this country during the nineteenth century, which followed the Industrial Revolution and included the exploitation of a virgin continent rich in natural resources, were attributed entirely to the functioning of free private enterprise. In the hands of interested parties, the system was identified with personal liberty and democracy, and the interests of the producers with national welfare. The philosophy of the business man as to the beneficial effects of competition, the infallability of the profit guide and the sacredness of private property is deeply embedded in American tradition and institutions. The mere cry of "socialism", "governmental interference", "governmental competition with private business", or "confiscation of private property", are often sufficient to hinder or prevent the enactment of restraining legislation.

It is true that the system of laissez-faire has been subjected to considerable criticism. The growth of large-scale business with the consequent segregation of management as a separate economic interest; the division of control and responsibility; the existence of non-competing groups and the immobility of much of the labor supply; monopolies and price-fixing methods; unequal bargaining strength; the unequal distribution of wealth; and the failure of consumers and laborers to discriminate against the producers who were not serving the best interests of society; have been fully revealed and discussed as factors which prevent the proper operation of the system. Such

criticisms have led to demands for governmental intervention to protect the interests of consumers and laborers, and have resulted in such legislation as the pure food and drug act, the anti-monopoly laws, the attempts to enforce fair competitive practices, blue-sky legislation, public utility regulation, control of the monied corporations, and labor legislation. Such governmental interference, however, does not violate the fundamental principles of laissez-faire. Their purpose is primarily to make the system operate as it was theoretically conceived, to correct the more flagrant abuses of the system.

National policy with respect to water resources has been in accord with this traditional role of government. Each particular use of water and the control of floods have been treated as separate problems to which the attention of the Federal government was directed only when they assumed an important role in the economic system. In each instance, the first aspect of national policy was the encouragement of private enterprisers to undertake the necessary action. And in each case, a particular economic group or a section of the country which hoped to realize an increase in wealth has played an important part in the direction of Federal policy. For example, the irrigation projects were constructed by the Government without regard to the complete utilization of the available water supply and entirely unrelated to the use of land for agricultural purposes in other sections of the country. The policy was adopted primarily at the insistence of the Western States and private irrigation enterprises which were unable to operate at a profit. Governmental assumption of the full responsibility for controlling floods in the lower Mississippi Valley was the result of a powerful

lobby representing the property owners who would profit thereby. Water power legislation was fiercely contested by the private power group and the States in which the valuable sites were located, and the legislation which was finally enacted was a compromise which was administered very much in the interests of the power group. A variety of economic forces affected the development of policy with respect to river improvements for navigation, ranging from those private individuals who desired a cheap means of transporting their products, to those who wished to have an effective weapon to force a reduction of railroad rates.

In each case, Federal policy has been based on the laissez-faire principle of keeping governmental activity at a minimum and encouraging private enterprise. The result has been an unplanned, uncoordinated, piecemeal program of utilization of water resources, for which Congress and the administrative agencies in charge of the various projects or aspects of water use have been criticized. In many instances such criticism is unwarranted for the real cause of the trouble lies in the institutional framework which restrains and directs governmental activity. The problems which have been encountered on the Federal irrigation projects are a good example. Elwood Mead, for many years the Commissioner of the Reclamation Service, and an authority on the subject of settlement and operation of reclamation projects, repeatedly stressed the necessity of complete control over all lands within the project, for aided and directed settlement, and for the full development of the potential water power at the project. These suggestions were viewed with disapproval and were rejected on the ground that they were merely sending "good money after bad", that the government is not a "real

estate agent", and that it should not be "put in the power business".

Throughout the history of the development of national policy with respect to projects for the development of water resources there has been a tacit assumption that these projects must be economically justified on the bases established by private finance, that those interests receiving the benefits should bear a proportionate part of the cost, and that projects should be self-liquidating. In respect to the improvement of navigable rivers, for example, the criterion for the adoption of projects, which was first definitely stated in 1865, was the amount of direct saving in transportation costs. This total saving was determined by estimating the cost of transporting the existing and potential water commerce by rail. If the capitalized value of such saving were equivalent to the cost of constructing and maintaining the project, the expenditure of Federal funds was justified. Because of the difficulties of determining such saving, the exaggerated expectations of local interests and the political influence of special interests, many projects were adopted which were not justified by this criterion. Such departures were, however, subjected to criticism. Much the same procedure is used by the Army Engineers to determine the justification of flood control projects, either by the Federal government or local interests. If the capitalized annual flood loss is equivalent to the cost of control works, the project is recommended as a "profitable" one. The concepts of private finance have been strictly applied to the Federal irrigation projects. Although the towns and industries which have grown up with the projects and are dependent on them for their continued existence have unquestionably benefited by the expenditure of Federal funds for the construction of irrigation works, the

full cost of the project is allocated to the settlers using the water for the cultivation of crops. The irrigation project has been viewed as a private commercial enterprise which must collect the full costs of construction and operation from its "customers". Otherwise, the project has been condemned as an unsuccessful undertaking.

The institution of private property is a fundamental aspect of our existing economic and social order. The privileges attached to the ownership of property are viewed as sacred rights which must be protected by collective action. These privileges include absolute freedom to use and dispose of such property as the owners may deem desirable, subject only to taxation and certain restrictions which prevent the use of property in such manner as may injure the value of adjoining properties. The use of property depends, of course, primarily on financial considerations of individual profit. This concept of property applies not only to the use of physical goods, however, but also extends to the expectations of the owners as to the value of this property and the income to be realized from its use. This problem has been amply illustrated throughout the history of national policy with respect to water resources. Navigation improvements have been denounced by the railroads as destruction of private property for it was anticipated that traffic would be transferred to the waterways, thereby reducing the expected income of the railroads. The need for adjustments and postponements of the water-right charges on the Federal irrigation projects has been due primarily to the capitalization of unearned increments by the landowners, which values society is expected to protect. The same problem of protecting property values is encountered in Federal flood control projects.

The theory of the competitive system is that property owners,

motivated by individual profit, will direct the use of their property in such a way as to automatically coincide with the public welfare. On the basis of this assumption, the protection of property rights and values are, accordingly, justified. Our national public land policy has been in accord with this philosophy of free private enterprise. The primary object of the Government was to dispose of this land as rapidly as possible. As soon as it was turned over to private individuals, the Government gave up forever all rights to direct the use of this land. As private property, the absolute rights of the owners was upheld by the courts. The rights of society, as represented by the Government, were subordinated to the rights of individual ownership. Such subordination of public interest can be accepted only on the ground that private interest does coincide with public interest. The experience of the past 150 years has definitely proven that such an assumption is utterly false.

The depletion and wasteful destruction of our natural resources, such as lumber, coal, oil, and minerals, under private enterprise has been realized for many years, and was the cause of the conservation movement in the early part of the century. Measures for strict regulation of the use of these resources were proposed, but the resulting legislation was very weak. The organized forces of private interests were too strong to pass any thorough-going conservation measures. Interest during that period was centered, however, on the more obviously exhaustible resources. Water resources received consideration only insofar as water power sites and navigation were concerned, both of which aspects of water utilization had considerable economic value to private interests. Water itself was looked upon as a free gift of nature, to be diverted and used by individuals,

corporations and municipalities as they wished. At the same time, the rivers and lakes were used to carry away sewage and industrial wastes. Land was considered as an inexhaustible resource, its only limitation being one of space. This early conservation movement did not, accordingly, give any serious consideration to problems of land and water utilization.

The results of this unrestricted use of land and water under a free, competitive economic system which is directed by financial considerations have been disastrous. The continuous culture of cash crops have led to serious depletion of soil fertility. Improper methods of cultivation, the use of the semi-arid plains and hillsides for crops, excessive grazing on pastures and grasslands, the improvident clearing of timber from watersheds, forest fires on cut-over lands, and unwise drainage of wet lands, have all led to a very rapid rate of soil erosion whereby millions of tons of fertile soil are carried away annually. This, in turn, has stimulated and been accompanied by a steadily increasing flood menace; the lowering of surface water levels and the groundwater table; the gradual destruction of an enormous investment in dams, navigation improvements, and water purification works. The unrestricted use of water has led to wasteful irrigation practices, and the jealousy of riparian owners and certain sections of the country have prevented the diversion of water to nearby watersheds where it could be beneficially used. Floods have continued to cause heavy annual losses throughout the country and flood waters were not stored for further use -- for irrigation, stream regulation for navigation, power, or domestic and manufacturing supply -- because the advantages of such storage could be realized only by coordination of many different interests in the

drainage area. Such coordination could not be achieved in a competitive, individualistic society. At the same time, with the growth of population and increase of property values in these flood areas, there has been a constantly increasing demand for flood prevention.

Uncoordinated development of power sites has led to the realization of but a small part of the potential power of a river system. The haphazard appropriation of water for irrigation, power, and domestic supply has led to innumerable conflicts between individuals, localities and States. The use of river systems as a dumping place for wastes and sewage has brought heavy damages to downstream municipalities and industries, destroyed the recreational possibilities of the river, and led to a rapid depletion of fish and wildlife. In order to realize the full advantages of our water resources, water transportation facilities should be coordinated with the railroads, and hydroelectric plants with existing steam plants and transmission systems in an orderly, economical manner. Neither of these objectives have been achieved under individual enterprise. As a result of the improper use and development of water and land resources, farmers in many sections of the country -- in the dust bowl of the Middle West, on the badly eroded lands in the South, and on the irrigation districts of the arid West -- are faced with the prospect of failure or a meagre income which is insufficient to support a family. Government expenditures for roads, schools and relief are very high in such sections. The drought of 1934 and 1936, with its accompanying dust storms, the floods in Pennsylvania and the New England States in 1935, and in the Ohio Valley in 1937 have been startling examples of the results of misusing these basic resources.

During the past few years, accordingly, there has been a very widespread change of attitude toward the system of free private enterprise insofar as water and land resources are concerned. The public works projects at Bonneville, Grand Coulee, Fort Peck and the Central Valley in California; the creation of the Tennessee Valley Authority; the activities of the Soil Conservation Service, the Resettlement Administration, the Federal Power Commission, the Forest Service, and other Federal agencies concerned with water and land utilization; and the recent studies by Federal and State agencies; all indicate that the present trend of national policy is in the direction of comprehensive regional planning. Such regional planning involves the coordination of all uses of water, including domestic and manufacturing supply, navigation, power, irrigation, and recreation; the interconnection of all hydro and steam power plants in the region; the conservation of water; the prevention of floods and stream pollution; the classification of land to direct it to the most beneficial social use; the supervision and direction of land use to maintain soil fertility and prevent soil erosion; the withdrawal of submarginal lands from cultivation; resettlement of the population; establishment of subsistance homesteads; and the direction of industrial location and development to improve the economic and social welfare of the region.

Such a plan is the direct antithesis of the individualistic, competitive economy in that it necessitates government ownership and operation of large projects in order to secure the unified development of a river system; either government ownership or complete control over private power undertakings; and the curtailment of many of the privileges previously enjoyed by private landowners. As stated

by Arthur E. Morgan, chairman of the board of the Tennessee Valley Authority, "our laws of land ownership should be changed so that if a man is handling his land in a way that will destroy it, the part he cannot take care of should be taken away from him and given to someone who will farm it properly, or be planted by the Government to some growth that will prevent soil erosion. A man has no natural right to inherit good land and pass on a waste of gullied hillsides to those who come after him. We are not complete owners of the soil, but only trustees for a generation."[1]

This change of attitude is not due to abstract arguments of social policy, but rather to economic necessity. Uncoordinated activity, motivated by the prospect of immediate personal profit, combined with an increase in population, specialization of farming, and industrial concentration, have led to the destruction of millions of acres of land, waste of valuable water resources, floods and dust storms and the consequent permanent impoverishment of the nation. The present interest in conservation and planning is due to the growing realization that collective action is essential to save the Nation's land and water resources and to realize the maximum benefits from the use of these resources. The studies which have recently been made by the National Resources Board, the Public Works Administration and state planning agencies have, accordingly, directed public attention to the need for a planned economy in order to conserve and utilize our national resources in the most beneficial manner. Their recommendations for cooperation, rather than competition, and the substitution of national and regional planning for the

1. Morgan, Arthur E., "Bench-Marks in the Tennessee Valley", Survey Graphic, Vol. 23 (January, 1934), p. 9.

profit motive and the price system as the guide to economic activity, to the establishment of industry and the use of natural resources, indicate this emerging concept of public welfare which may lead to fundamental changes of policy. It looks directly to the well-being and happiness of the people, not only for the present but also for future generations, and distinguishes political economy from private economy.[2] Throughout the reports of the National Resources Board the emphasis is on social welfare, departing from the narrow confine of the price system and considering the many elements of utility which are not measured in money and have no place in the individualistic, competitive economic organization. It is concerned primarily with the relation of man and his resources, in a perpetual rather than an impoverished environment.[3] This broader concept of the economic and social organization makes the government directly responsible for the general welfare "because governments can do things that individuals and small communities cannot. Governments have an inescapable responsibility for the conservation and wise use of all natural resources, especially soil and water. Owners have actually merely a lifetime interest in their lands; but communities, counties, States and the Federal government have a perpetual interest in the preservation of this indispensable asset."[4]

2. "We are accustomed to think and to evaluate things in terms of money. But money is only a symbol that for convenience of exchange effaces all qualitative differences between commodities and services. Consequently business becomes concerned with numerical abstractions and the realities are lost. We know, however, that the only basic reality is the actual goods and the actual services that satisfy our needs." (Report of the National Resources Board, 1934, p. 363.)

3. "This enlarged conception has as its basis the realization that man is the center around which all economic activities circulate and by whose needs and interests all are judged. Because many benefits do not have monetary equivalents, they are disregarded in reports which consider only the calculable items." (Ibid., p. 363.)

Comprehensive Planning for the Use of Water and Land Resources

When the subject of water resources is considered from this broader viewpoint of social welfare, the uses and control of water which have been considered in the preceding chapters are seen in an entirely different perspective and the scope of the subject is greatly extended. Attention will first be given to the scope of the subject, to the additional aspects of water utilization which have not as yet been considered and the relation of water to land use, and the extent to which the Federal Government has recognized or taken any action with respect to these problems. In the light of this discussion, the position of navigation, irrigation, power and flood control in the comprehensive plan of development will be reviewed.

Water supply for domestic and manufacturing purposes.

The use of water for domestic purposes has always been recognized as its highest, most beneficial use. Wherever water is scarce, as in the arid States, all other uses of water must yield to domestic usage. The problem of providing an adequate public water supply has been left primarily to the municipalities. In addition to domestic usage, water is needed by many manufacturing concerns in large quantities. A steam power plant, for example, uses from five hundred to a thousand tons of water for each tone of coal consumed. Furthermore, the quality of the water often plays an important role in manufacturing processes. Industries are limited both as to size and location by the availability of water of suitable chemical composition.

4. Little Waters, by H. S. Person, with the cooperation of E. Johnston Coil and Robert T. Beall, prepared for the Rural Electrification Administration, the Soil Conservation Service, and the Resettlement Administration, Sen. Doc. 198, 74th Cong., 2d sess., p. 70.

One is inclined to look upon water as a free gift of nature which exists in abundance and needs only purification. Actually, this is far from true. With increasing urban populations, cities have been forced to go to great distances at high cost to secure adequate water supplies. The availability of good water is a decisive factor in limiting the growth of cities. Los Angeles is an outstanding example of such a case, securing its water from the Sierra Nevadas at a distance of 250 miles. An aqueduct is now being constructed from the Colorado River, 210 miles in length, to meet the constantly increasing demands for water from Los Angeles and the surrounding cities. San Francisco secures part of its water supply at a distance of 170 miles and New York City at a distance of 125 miles. Denver has been forced to consider the possibilities of tunneling through the mountains to reach the Colorado River for additional public water supply.

In many cases municipalities would not have needed to go to great distances at large expense for an adequate supply of water for a much closer source would have been available had it been protected and preserved to keep it suitable for consumption. There were but a few municipalities, however, which recognized this problem and attempted to plan for future needs. In many cases the individual municipalities were unable to cope with the problem for the source of pollution was far removed. As the cities have reached farther out for additional water supplies the seriousness of the situation has been gradually realized, and conflicts have arisen between cities and States over the use of water. The state of California has fully recognized the problems of water utilization and has made a series of studies looking to greater conservation and more efficient utili-

zation of the water resources of the State. Just recently the state of Maryland has created a Water Resources Commission to study the underground and surface supplies of water with a view to formulating plans for their preservation, allocation, control and regulation.

There will be many instances, however, where the problem of supplying future needs for public uses is beyond the control of a single State inasmuch as interstate streams are involved. Such a case is the Delaware River. The cities of New York, Philadelphia, and northern New Jersey are all looking to the Delaware to meet their future water needs. Should New York divert large quantities from the upper river, there would be immediate conflict with the other cities. When the Army Engineers surveyed the river they considered the supply of water for municipal purposes of paramount importance in the future utilization of the Delaware watershed. The Delaware is an excellent example of the need for considering all aspects of water utilization in a drainage basin. In the middle and upper parts of the basin there are numerous power sites which are capable of development to serve a dense population and many industries. This power cannot be fully developed, however, unless it is coordinated with the storage and regulation necessary for these water supply projects. The Engineers recommended that all future water supply and power developments within the watershed be coordinated, and supervised or controlled by an interstate agency, in order to avoid conflicts between the States and to allow the fullest use of the water.[5] The three states have attempted to reach an agreement for the allocation and use of this water but all negotiations have been unsuccessful. The problem of the proper use of the river has greater ramifications,

5. Report on the Delaware River, H. Doc. 179, 73d Cong., 2d sess.

however, than power and municipal water supply. In the upper regions of the watershed in New York State there is a large State forest project with high recreational values and a program for the withdrawal of submarginal farm lands from cultivation which are directly related to the assurance and purity of the water supply. In the lower portions of the river there is a serious pollution problem as a result of mine and industrial waste and city sewage, which interferes with the use of the water by industries and municipalities, destroys the recreational value of the water and is very injurious to the fishing interests in the bay.[6] These various aspects of the problem of utilizing the Delaware River cannot be considered separately.

The United States Geological Survey has aided municipalities and industries in regard to this problem of water by collecting very valuable data. For the past forty years the Survey has maintained base-gaging stations to provide continuous stream-flow records. The States and municipalities have contributed to the cost of collecting this information.[7] At the present time, local and State contributions amount to more than one-half million dollars annually. The importance of accurate stream flow records cannot be overemphasized. The Survey has reported that these records "are used constantly by engineers, financiers, attorneys, and courts in connection with the

6. Development of Rivers of the United States, H. Doc. 395, 73rd Cong., 2d sess., p. 7.
7. Congress has attempted to distinguish between Federal and local interest in the collection of this data and has grouped the stations on this basis as a means of dividing the cost. Federal interest in the maintenance of adequate records, as indicated by the Geological Survey, "may be evidenced in matters relating to interstate and international streams, the development and use of power, the administration of the public domain (including national forests, parks, grazing, and agriculture), flood control, navigation, irrigation and drainage, river erosion, highways and bridges, public health and recreation, and fish and wildlife." (Ibid., p. 10.)

design, construction, and operation of works utilizing water, in the liquidation of damages caused by water and ajudication of rights in water. The records are also used extensively in connection with problems of administration by Federal and State agencies."[8] These records are essential as a basis for Federal activity in the development of water resources, and for State and regional planning.

In addition to stream-flow records, the Survey maintains a laboratory in Washington to study the chemical quality of water. Particular consideration is given to the use of this water for agricultural, industrial and municipal purposes. This information is valuable in securing public water supplies and in the selection of industrial sites. With the increasing use of water for other purposes, the problem of meeting the growing demands for public and manufacturing usage is becoming a difficult one in many parts of the country, and necessitates cooperative action by municipalities, States and the Federal Government to conserve the best sources of water supply.

Underground water supply.

The importance of the underground water supply and its relation to surface water supply had been given little attention until the period of drought in the Middle West during 1930, when relatively little difficulty was experienced with the public water supplies derived from wells. The importance of this source of water is apparent from the estimates of the Geological Survey that nearly 20,000,000 people of the country depend on public water supplies derived from wells, and over 30,000,000 depend on private well supply. Furthermore, more than two million acres of agricultural land are irrigated

8. Ibid., p. 31.

from wells. An additional recent use of underground water supplies is in cooling systems. In many parts of the country, the temperature of the underground water is low enough to meet cooling requirements. Should this practice become very widespread, it may have a serious effect on the water table. The importance of underground reservoirs is indicated in the following statement of the Survey:

> "The importance of the underground reservoirs in comprehensive plans for the highest utilization of the water resources of the country and the nature of the problems relating to their utilization have not been generally appreciated. Their advantages are that they are already in existence, that they are accessible over wide areas by means of wells, that they can for the most part by protected from bacterial pollution, and that because of their great capacity and relative protection from evaporation they are available for hold-over storage throughout the cycles of wet and dry years."[9]

The general decline of the groundwater table in the Mississippi Valley and other parts of the country during recent years has emphasized the importance of this source of water supply.[10] Underground water is not only an important source of water for public and industrial uses, but it also has a very important bearing on stream flow and consequently on navigation, irrigation and power development. The Geological Survey has recently been conducting investigations of the extent and quality of groundwater supply and its origin and movement.[11] On the basis of this investigation, the Survey stated in 1934 that "the time is ripe for the application of the most rigid technique available in a thorough quantitative evaluation

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9. Ibid., p. 29.
10. See the report of the Mississippi Valley Committee, op. cit.
11. The Survey was alloted $2,321,000 by the Public Works Administration for topographical and underground water supply surveys; and for underground water studies alone, an additional $120,000. The States and municipalities have contributed to the cost of these investigations and have cooperated with the Federal bureau.

of the underground water supplies of the country, and the development of a comprehensive policy of utilization and conservation."[12]

Stream pollution.

The importance of maintaining rivers in the highest possible state of purity is self-evident, inasmuch as the water is used for domestic purposes; in the manufacture of many products for which pure water is a necessity; for the irrigation of crops; and for recreational purposes. On the other hand, in many regions of the country the only means of disposing of the sewage of cities and the wastes of industrial plants is by means of the rivers. There is, consequently, a certain degree of pollution which is unavoidable. The need for protection of rivers has become increasingly important with the growth of population and the concentration of industry. The drought further increased the problem of stream pollution as the low water flow was not sufficient to dilute waste materials. Pollution imposes a heavy financial burden on municipalities and industry. It is estimated, for example, that the depreciation of the quality of water because of mine drainage is costing the railroads running east from Pittsburg from twelve to twenty million dollars annually because of corrosion and scale in locomotives. The pollution of the Connecticut River by industrial wastes and raw sewage has completely destroyed the oyster industry at the mouth of the river.[13] The textile and paper industries require a high quality of water. Heavy losses have resulted from the use of polluted water.

Some cities have abandoned older sources of water supply be-

12. Development of Rivers of the United States, op. cit., p. 30.
13. For a statement of the pollution problem of the Connecticut River see the article by Marion Murray, "Cleaning Up the Connecticut", New Republic, Vol. 80 (September 12, 1934), p. 127.

cause of pollution and have gone to considerable expense to secure purer sources of water. Albany has recently spent $7,000,000 to secure a better source of public water which was formerly taken from the Hudson River. Other cities have been forced to go to elaborate precautions in the construction of expensive purification works because there existed no alternative source of supply within reasonable distance. In most of the States, the control of the quality of public water is under the supervision of the State boards of health. The standards are, however, comparatively low. The National Resources Board estimated that one-half of the public water supply systems in the United States deliver untreated water to their consumers, who represent about one-fourth of the population served by public water supplies. A still larger number of persons use water that has been treated only with chlorine, which is not a complete purification agent.

In view of the fact that water is reused many times for different purposes, the necessity for maintaining a river as pure as possible cannot be overemphasized. The rivers in Colorado are so badly polluted by raw sewage that the use of the water for irrigation purposes is injurious to the public health. The situation has received attention from both the State Medical Society and the United States Public Health Service. After a recent survey of these rivers the Federal Health Service stated that "the pollution of streams is becoming increasingly important in Colorado . . . as a hazard involved in irrigating fruits and vegetables grown in the valleys."[14] The Bureau proposed that these products be banned from interstate commerce.

14. Editorial, "Colorado, Health Resort?", New Republic, Vol. 79, (July 11, 1934), p. 224-5.

Many of the smaller streams in the country are so badly polluted that people cannot live near them and their only purpose is as drainage for sewage and wastes. Among the larger rivers, the Ohio, the Connecticut, the Hudson and the Delaware are badly polluted. The Ohio cannot be used for recreational purposes at all, and presents a serious problem to those communities which obtain their water supply from the river. The National Resources Board stated in its report in 1934 that "notwithstanding the intelligent and cooperative programs, industrial waste and domestic sewage problems are outstripping the best efforts of those whose function it is to effect economical and rational balance between regulation and industrial expansion."[15]

The problem of pollution by raw sewage can be handled by the installation of proper sewage treatment plants. The initial expense is costly, but the resulting protection of water supplies more than justifies the expense. In some instances, State or Federal coercion as well as financial assistance may be necessary. In Colorado, for example, there is apparently little consideration in the principal cities of installing sewage-treatment plants. The Public Works Administration proferred a $2,000,000 loan and grant to Denver for that purpose but it was refused. For the most part, however, the municipalities have expressed their willingness to cooperate if offered some financial assistance, as evidenced by the number of applications to the Public Works Administration for this purpose. The latest report of the Board on public works planning lists hundreds of specific projects for sewage treatment plants throughout the country which are recommended for immediate construction.[16]

15. Report of the National Resources Board, 1934, p. 314.
16. Public Works Planning, National Resources Committee, 1936.

The problem of industrial waste disposal is far more difficult than that of domestic sewage. If regulation is too severe, it will result in stifling industry. For example, the distilleries in and near Louisville, Kentucky are dumping tons of waste products into the Ohio River daily. Until some other method is found for the disposal or profitable utilization of this waste, however, the State officials will probably not be able to correct the situation. In many cases valuable by-products are contained in this waste material, but private industry will not extract these by-products unless it is profitable to do so. The corn products industry is an outstanding example of one which has developed many by-products from material which was formerly dumped into rivers. The industry must be operating on a very large scale, however, as a rule, before by-products are economically possible. The National Resources Board has advocated a study of industrial wastes under Federal auspices to ascertain their economic value or usability, inasmuch as such studies are too costly for single enterprisers. The Board recommended an appropriation of ten to twenty million to initiate a program of study and investigation of industrial wastes, and stated that these expenditures for research may not be self-liquidating, "still, in the broader sense, the ultimate results will be of this nature."[17]

The Secretary of War has the authority to regulate the dumping of all refuse material into navigable streams in the interests of navigation.[18] This power has not been exercised in any way, however, to regulate stream pollution from sewage and industrial wastes

17. Report of the National Resources Board, 1934, p. 315.
18. 33 Stat. 1147.

in the liquid state. Under the act of March 3, 1899, the dumping of any refuge material into navigable streams from vessels, wharves or manufacturing establishments other than that flowing from streets and sewers in a liquid form was prohibited.[19] In 1924 the Federal Oil Pollution Act was passed which prohibits the discharge of oil upon costal navigable waters except in accordance with such rules as may be promulgated by the Secretary of War.[20]

The problem of pollution must be considered by drainage basins, with particular emphasis on population and industrial centers. It cannot be satisfactorily dealt with by these particular cities. In some cases, the States may be able to handle the problem. For interstate streams, however, it is probable that Federal action will be necessary. Within the past few years, both the States and the Federal Government have given the problem some attention, probably as a result of the activities of the National Resources Board. With regard to pollution from mine drainage, the sealing of abandoned mines is the least expensive and most satisfactory control method known. During 1933 and 1934 the State of Pennsylvania spent $200,000 to seal 286 mines and closing shafts and caves. The work was done on the watersheds of the Monongahela, the Susquehanna and the Allegheny Rivers. The States of New York, New Jersey and Connecticut have formed a tri-state commission to deal with the problem of pollution of the New York Harbor and adjacent waters. Recreational use of the beaches has been impaired and the fishing interests and industrial consumers of water have suffered financial losses. The states in the Ohio River basin have also formed an interstate Board

19. 30 Stat. 1152.
20. 36 Stat. 593.

of Health to deal with the problem of stream pollution. In 1933 the state of Kansas passed an act to control stream pollution in the state, vesting jurisdiction in the state board of health to make rules and regulations for the disposal of domestic and industrial sewage wastes by municipalities, corporations, or individuals.[21] Under the Public Works Administration a number of projects have been authorized dealing with the problem of pollution.[22]

These measures are, of course, but an approach to the problem and merely indicate the interest which is being shown in controlling pollution. In the past session of Congress, Senator Lonergan of Connecticut proposed a Federal program of pollution control. One bill introduced by the Senator provided for the division of the United States into sanitary water districts to conform, insofar as practicable, to the areas of watersheds not wholly contained within the boundaries of one state. A Federal administrative agency was to establish standards of purity for the water of each district and minimum requirements as to the treatment of sewage and industrial wastes before discharged into the rivers.[23] The second bill provided for the extension of the provisions of the Oil Pollution Act to tributaries of costal waters. This bill also proposed to amend the act of 1899 to include sludge, acids and sewage in a liquid state as well as other matter.[24]

21. A copy of the act is printed in the American Journal of Public Health, Vol. 24 (July, 1934), p. 738.
22. The Geological Survey received $200,000 for the plugging of abandoned wells on the public lands, of which there were approximately 769 in number. $438,200 was granted for safeguarding mine openings, and controlling surface and subsurface water on Indian reservations and the public lands. The Bureau of Fisheries received $25,000 to study stream pollution in the Middle West, and the Public Health Service $25,000 for a study of the elimination of pollution of the Chesapeake Bay.
23. S. 3958, 74th Cong., 2d sess.
24. S. 3959, 74th Cong., 2d sess.

An immediate objection to these bills was registered by the National Chamber of Commerce and the attention of its members, "representing communities with sewage problems", and of trade organizations, "representing industries with a very large stake in the proper solution of this problem", was called to this proposed legislation. The Chamber of Commerce has consistently advocated that the states and local communities retain control over all matters relating to water resources.[25] The same bills have recently been reintroduced by Senator Lonergan.

Recreational facilities.

The impounding of water for purposes of navigation, irrigation, power and flood control may incidentally afford excellent recreational facilities for boating, camping, fishing and bathing. This possibility has been recognized by the Federal Power Commission and the Reclamation Service, and these agencies have made the attempt to provide for recreation in the construction of power and irrigation dams. An outstanding example of the recreational advantages which can result from power development is the Bagnell Dam project of the Union Electric Light and Power Company on the Osage River in Missouri. The purpose of the power development is to supply the increasing demand of the St.Louis area. The reservoir of the Bagnell development, known as the Lake of the Ozarks, is about 110 miles long and has a

25. The grounds for opposition to the Lonargan bills were stated as follows: "The Chamber recognizes the importance of adequate measures to cope with water pollution. It is opposed, however, to wholesale transfer of activities to the Federal Government that should be retained by state and local communities. By leaving this responsibility upon the state and community, there will be best protection of economic needs and encouragement of initiative, efficiency, and economy in planning, executing and administering projects. Thereby is preserved, also, the integrity of local government." (Chicago Tribune, February 29, 1936.)

shore line of over 240 miles. The Lake is rapidly developing as a summer resort. The Power Commission can do no more, of course, than to include certain provisions in licenses which will increase the attractiveness of power reservoirs and allow development of recreational facilities by private interests. The Reclamation Bureau, however, having jurisdiction over the construction and operation of the Federal irrigation projects, has been in a position to take positive action to develop the storage lakes as recreational centers. During recent years, increasing attention has been given this aspect of the problem.

If the proper provisions are made, recreational opportunities can be simultaneously created with water and land developments. On the other hand, they may be destroyed by such developments. In the report of the Pacific Northwest Commission, emphasis is placed on the need for preservation of cultural and esthetic qualities of both water and land in planning the economic development of the region. In the past, the pioneer developments in any region, governed by the profit motive, have needlessly destroyed valuable recreational and esthetic assets. As stated by the Commission:

> "The problems to be brought on by industrial and urban developments, and by the development of large irrigated areas, will be still greater. For orderly growth, with a minimum of confusion and waste, highways, towns, parks, and reserves must be planned and controlled by means of public land ownership, land classification and zoning. The same forms of control should apply to these as to dams, irrigation canals, and forestry approvements. In other words, the planning of public works . . . . should definitely make provision for broad land planning and for secondary water uses, having recreation definitely in mind."[26]

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26. The Columbia Basin, Report of the Pacific Northwest Regional Planning Commission, December, 1935, p. 69.

Preservation of fish and wildlife.

As has previously been indicated, the interest of the fishing industry has been protected by State laws wherever obstructions have been placed in the rivers. The Federal Bureau of Fisheries has co-operated with the States to protect fish runs. Provision for the protection of fish is another instance of an economic interest which conflicted with other uses of water. Much less consideration has been given to the protection of fish in those streams where fishing was not an organized industry.

The protection of wildlife is another important aspect of water utilization. An adequate supply is essential to the existence of most of the wild fowl and such fur-bearers as muskrats and beavers. In addition, there are many kinds of shore birds and fish-eating birds who are dependent on water. These various birds and animals require an adequate, dependable and pure supply of water. The subject of wild life preservation is closely related to that of stream pollution. The presence of sewage, oil and industrial wastes in water have been responsible for great destruction of wildlife. In order to preserve this wildlife, it is necessary to set aside certain lake areas and swamps for the primary use of these birds and animals, to maintain an adequate water supply on these refuges, and prevent trepass thereupon.[27] The Biological Survey, in the Department of Agriculture, has attempted to meet these needs for migatory fowls but has been serious handicapped by lack of funds.

27. Wildlife resources of the Nation provide meat and fur valued at almost two hundred million dollars annually. Expenditures by hunters and tourists attracted chiefly by the abundance of game aggregate over four hundred million dollars. In addition, wildlife is of incalcuble social value in destroying insects preying upon agricultural crops and forest trees.

As of May 1, 1934, there were wildlife refuges for birds and big-game under the Biological Survey aggregating 828,034 acres. These are located in twenty-seven states and Alaska. The Survey also administers as wildlife refuges, mostly for birds, 1,206,018 acres in reservoir sites developed by the Reclamation Service. This acreage is distributed in eleven western states, but over half of it is at the Boulder Canyon project. Under the Public Works Administration, the Survey was alloted $426,000 for water control and conservation dams in the national wildlife refuges. The National Resources Board has recommended additional big game preserves in the western states, and the acquisition of seventeen million acres of marsh and water areas by public authorities for the restoration and conservation of waterfowl; also for the improvement of wildlife administration within the national forests.

Plans for coordinated development of water resources should include consideration of this aspect of the problem. Moreover, before measures are taken to reclaim marsh and swamp land for agricultural purposes, serious consideration should be given to the alternative social benefits to be derived from the maintenance of these lands as wildlife refuges. In most cases, these lands should not be set aside primarily for refuges but should be coordinated with other uses of the area, particularly recreation. A national plan for wildlife conservation will necessitate close cooperation between the states and the Federal Government inasmuch as the jurisdiction of the latter over game and birds is very limited.

Distribution of industry.

The location of industries is dependent on many factors, such as the source of raw materials, the existence of markets, transportation facilities, an adequate water supply, and power. The development of water resources consequently plays an important role in the distribution of industry. In some cases, the needs for large supplies of cheap power are essential, such as in the electrochemical and electrometallurgical industries. Conservation of ample supplies of pure water in a region and the development of a river system for transportation are important factors in attracting various kinds of industries. The development of irrigation projects creates urban centers and affords a market for industrial products. And the combined factors of power, water, transportation and markets will lead to the utilization of resources of the region. The state and Federal planning agencies are considering the possible means of attracting industrial development in those regions which are predominantly agricultural in order to maintain a better economic balance in the region and to afford a means of supplementing the cash incomes of the people in the area. The relation of the distribution of industry to land use will be considered later in regard to the subsistence homestead projects.

Water and land utilization.

Within the past few years national attention has been aroused to the realization that utilization and conservation of water is directly and inseparably related to land usage; that the effect of laissez-faire has been the impairment and destruction of these resources which are vital to the continued existence of the Nation; and that national planning must replace uncoordinated individual

activity. Prior to the settlement of the country it was completely covered with vegetation, ranging from grasses to dense forests. This vegetation held the soil and rendered it porous, which was conducive to adsorption and infiltration by means of which large supplies of water are held in the ground and stream flow is regulated. There were, in addition, numerous small ponds and lakes, marshes and swamp lands which held the water back from the rivers. The natives did little to change the character of the land surface and its vegetation. The vegetation and the soils covered by it were the natural result of long processes of soil and plant development. The rivers which ran through these regions covered with dense vegetation were essentially clear except during flood periods when the soil carried away by the rivers came primarily from the river channel. Little surface washing occurred and the extent of erosion did not exceed soil formation under these native conditions.

In a comparatively short period of time, exceedingly short when compared with the years required for this growth of vegetation and soil formation, colonists spread over the country, clearing away the coverage and putting land under cultivation. Game was slaughtered, forests were recklessly cut and burned, the prairies were put under cultivation, and cattle and sheep turned into the semi-arid grasslands. There was no thought of conservation, no thought of planning for future use of the land, and certainly no idea of the disastrous consequences of their activities to settle the continent. These activities led to rapid growth of personal wealth, which was identified with national wealth, but depleted the heritage of following generations. Many problems for this and future generations have arisen from this period of settlement. Public land policy encouraged

such activities by the settlers. The Homestead Act, the Carey Act, the Desert Land Act, the Swamp Act, and large grants to the railroads and the States for internal improvements, served to increase the destruction of natural resources and the balance between water and land. No attention was given to fires on cut-over land because the valuable timber had been removed. Such fires, however, destroyed the protecting litter, humus and roots and the top soil was then easily washed into the streams.

Drainage has played an important role in disturbing water and land balances. It is quite true that drainage has been highly beneficial in many instances from the point of view of making productive land available. On the other hand, as indicated by recent government reports, "a considerable amount of this drainage has not been selective, especially that of organized drainage enterprises, of which many were induced by public policy to become highly speculative. These have brought what have proved to be marginal and even submarginal lands into use, have created many problem spots in the agriculture of the United States, and in too many localities have had a wide-spread unfavorable influence on some of the basic hydrologic balances."[28] In addition to drainage for agricultural purposes, modern highway and railroad construction includes provisions for drainage, to protect the right-of-way. Widespread drainage has resulted in increased surface run-off, the lowering of natural surface reservoirs, and groundwater supplies.

With the clearing of forest areas, the cultivation of the lands and pasturage of cattle on the prairies and in the hills, there began a rate of soil erosion which greatly exceeded the rate of soil

28. Little Waters, op. cit., p. 22.

formation over vast areas. Topsoils were washed away, leaving the raw subsoil exposed, such as is conspicuous over the entire Piedmont area of more than fifty million acres. Wherever the topsoil is removed, the run-off is greatly increased due to the greater imperviousness of the exposed clay subsoil. Moreover, as stated by the Soil Erosion Service,[29] "concentration of run-off has cut enormous gullies through the topsoil and subsoil into the underlying material, which in many instances is less stable than the material above. So enormous has been the work of accelerated erosion as to reduce and destroy the productivity of millions of acres of the land of densely populated regions of the United States within less than a century. The economic and social aspects of this transformation have been tremendous."[30] The National Resources Board reported an annual net loss of 222,000,000 tons of organic matter of crop and pasture land, over half of which is due to erosion. At least thirty-five million acres of land have been completely destroyed for farm use, the top soil has been nearly removed from an additional 125,000,000 acres, and another one hundred million is starting in the same direction.[31] The situation is, obviously, a serious one.

This rapid acceleration of soil erosion has resulted in costly floods and sedimentation which have endangered or destroyed billions of dollars of investments in navigation and irrigation projects, in hydroelectric properties, in municipal water supply systems, as well as valuable farming and grazing lands. What were formerly fertile soils have been washed away to become troublesome sediments. Large-

29. Now known as the Soil Conservation Service.
30. Development of Rivers of the United States, op. cit., p. 35-6.
31. Report of the National Resources Board, 1934.

scale erosion has resulted in the shoaling of rivers and streams which makes navigation difficult if not impossible. The deposit of sediment in river channels makes constant dredging activity necessary. More important, however, is the silting up of reservoirs impounded by dams for various purposes of water utilization. The Soil Erosion Service reported that many reservoirs impounded by dams for power purposes in the Piedmont region on the Atlantic coast had silted up to the very brim in the last forty or fifty years.

> "On the Deep River in North Carolina, eleven out of thirteen such dams are reported to be entirely silted up. The reservoir at Oakdale near High Point is now silted to the brim after forty years and is a portentous example of the results of soil wastage on cultivated slopes within that drainage. On the other hand, the irrigation civilization of the West is doomed if the accelerated rate of silting in the reservoirs is not soon brought under adequate control. Hundreds of millions of dollars have gone into the construction of dams for power and for irrigation in the arid and semi-arid West. The Austin Dam in Texas has silted up to 84% of its capacity in twenty years. The Elephant Butte Reservoir silted up in the first decade of its existence at a rate which forecast a life of 233 years. So rapid has been the rate of increase in silting that in the last half decade the annual average deposition of silt has doubled. . . . . This rate without further increase reduces the prospective life of this reservoir to 100 years. But still more ominous is the fact that within fifty years the storage capacity of this reservoir would equal the annual draft of water for the irrigation needs. During dry years the lands will suffer a shortage of water and from that time on irrigation under the Elephant Butte reservoir will be a precarious enterprise.
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> These are samples of many other instances which ominously forecast financial losses, social insecurity and depopulation of regions dependent upon water stored in reservoirs. In the long view ahead, the situation is critical and calls for statesmanship in planning for coordinated uses of all the resources of water and land within these regions."[32]

In order to curb this steady process of destructive soil erosion resulting from the misuse of land and leading to the destruction of valuable fertile land, acceleration of run-off and sedimentation of reservoirs and stream channels, a national plan for the proper util-

32. Development of Rivers of the United States, op. cit., p. 36.

ization and conservation of land and water must be adopted and faithfully executed by the cooperative activity of the Federal Government, the States and individual landowners.[33]

Under the National Resources Board a survey was made of the various kinds of land in the United States and the probable future needs of the country for land was estimated. Many present maladjustments in the uses of land were indicated and a program outlined for future public land policy.[34] As stated by the Board, this Land Report "presents a complete reversal of the attitude of heedless and unplanned land exploitation. It reflects the point of view that public policy should aim at effecting such ownership and use of land as will best subserve general welfare rather than merely private advantage."[35] The committee reported that seventy-five million acres of land in farms were so unfavorable, from a physical and economic standpoint, that they should be retired from arable farming and devoted to other uses. Of this total, 20,163,000 was in cultivated crops and 34,883,000 in pasture. These farms are located in hilly, forested areas; in the dryer portions of the Great Plains; regions of sandy soil; and in areas of serious erosion. The soil is steadily deteriorating and economic and social conditions are growing steadily worse. These areas are sparsely settled and the standard of living extremely low. The cost of maintaining schools and constructing roads in these sparsely settled sections are very high. A survey of land utilization in New York State revealed that in such areas of

33. A good statement of this problem of land use is given by Stuart Chase in his recent book, Good Land, Bad Land, McGraw-Hill Book Company, Inc., 1936.
34. See the Report of the National Resources Board, June, 1934.
35. Ibid., p. 8.

the state, containing large areas of idle and abandoned land, the state paid 84% of the cost of operating one-teacher school districts; whereas in other sections where the land was of better quality and more intensively used the State paid only 47%. In the first case, the State-aid for schools would equal the full value of the property in the district in twenty-eight years; in the latter case it would take 243 years.[36]

The only solution for the farms in these districts is a program of land purchase and resettlement of the population to more favorable environment. In other parts of the country, the problem of erosion can be met by the application of the proper methods for conservation of the soil and water. Such methods will differ in each section of the country and even on each individual farm. The basic factors in such a program, however, are as follows:

a) Selective use of land; depending on topography, the character of the soils, and in some degree on market conditions and facilities;

b) The rotation of crops for purposes of soil and moisture conservation as well as the replenishment of the humus supply and fertility;

c) The proper method of cultivation, such as contour planting, strip planting and terracing;

d) Check dams in gullies for those lands already seriously eroded;

e) Check dams on streams to prevent bank erosion and conserve the water for later use;

f) The construction of ponds and small reservoirs by individual farmers or a small cooperative group. Such surface water supplies

36. Land Utilization and Classification in New York State, by T. E. LaMont and H. S. Tyler. New York Bulletin A E-119.

promote infiltration and increase the supply of groundwater, provide water for various important farm uses, and attract wild fowl. These reservoirs would also be very valuable for means of supplementary irrigation, the importance of which has not been fully realized.

g) The proper retention of swamps, marshes and wet lands.[37]

In 1929 a growing realization of the danger of soil depletion and erosion led Congress to make an initial appropriation of $160,000 for the establishment of soil erosion stations for purposes of research as to the character and extent as well as the methods of control of the erosion problem.[38] Information was dissimated by these experimental stations to the general public and to individual farmers. The Agricultural Adjustment Administration also attempted to reach this problem of erosion to some extent in its crop adjustment program by encouraging the planting of soil protecting crops on the area withheld from the basic crop production. Under the supervision of the Forest Service, 124 Conservation Corps Camps of two hundred men each worked exclusively on erosion control problems, in cooperation with State conservation commissions. This work was done largely on privately owned lands.

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37. For an excellent statement of the problem of retaining water on the land and the methods of accomplishing this purpose see the Government report on Little Waters, op. cit.

38. Prior to this time a few scattered attempts had been made to study and control erosion. In 1903 the experimentation stations of the United States Department of Agriculture undertook field studies of hillside drainage with a view to devising some means of reducing erosion. A field investigation of terracing was started in 1914 and continued under the Bureau of Public Roads and the Bureau of Agricultural engineering until taken over by the Soil Conservation Service in 1935. In 1917 experimental work was conducted at the University of Missouri to determine rates of run-off and soil losses. Similar work was done in 1926 at Spur, Texas and Guthrie, Oklahoma.

The work of these soil erosion stations was administered by the Forest Service, the Bureau of Chemistry and Soils, and the Bureau of Agricultural Engineering, all in the Department of Agriculture.

The Soil Erosion Service was established in 1933, under the Department of the Interior, by the Public Works Administration, and granted an initial allotment of ten million dollars. Representative districts were chosen by the Service for various types of erosion in different parts of the country to demonstrate the proper methods of control. The importance of these demonstration projects is indicated in the following statement of the Service;

> "If this demonstrational and experimental work can be successfully put through, and there is no question but that it can be, it is obvious that the educational effect will be tremendous. . . . .
>
> The evidence points very strongly to the possibility of extending the work from these focal points to cover all areas needing treatment. If this can be done, and certainly every indication is that it can be, then one of the major parts of the most beneficial use of the Nation's water resources will have been solved. Until this part of any program that may be adopted relating to the beneficial use of water is effectively put through, there can be no hope for any large reduction of the silting of streams and reservoirs, or of the prevention of the covering of valley lands with infertile products of erosion, or the avoidance of depletion and destruction by sheet washing and gullying of a large proportion of the Nation's indispensable agricultural lands."[39]

In 1935 the Soil Conservation Service was made a permanent agency and transferred to the Department of Agricultural by the Soil Conservation and Domestic Allotment Act,[40] which replaced the outlawed Agricultural Adjustment Act. Heavy emphasis is placed throughout the act on the need for conservation of soil.[41] The Secretary of Agriculture is empowered (1) to conduct surveys relating to the

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39. Development of Rivers, op. cit., p. 44.
40. 49 Stat. 163.
41. The purpose of the act is stated as follows: It is hereby recognized that the wastage of soil and moisture resources on farms, grazing and forest lands of the Nation, resulting from soil erosion, is a menace to the national welfare and that it is hereby declared to be the policy of Congress to provide permanently for the control and prevention of soil erosion and thereby to preserve natural resources, control floods, prevent impairment of resources, and maintain the navigability of rivers and harbors, protect public health, public lands and relieve unemployment.

character of soil erosion and preventive measures needed and publish the result of such studies; (2) to conduct demonstrational projects in areas subject to erosion by wind and water; (3) to carry out preventive measures; including engineering operations, methods of cultivation, the growing of vegetation, and changes in the use of land; (4) to acquire lands by purchase, gift or condemnation to carry out the purpose of the act; and (5) to cooperate with and render financial assistance to private and public agencies dealing with the problem of erosion. The scope of authority of the Secretary is very limited, however, including only the public lands, and private lands "after obtaining proper consent or the necessary rights or interest in such lands." Under this statute the Service is now carrying on operations in 156 demonstration areas in forty-three states, directing the work of 450 C. C. C. camps, and conducting erosion control studies at some cooperative experimental stations and research projects.

Such demonstrational and research work is, however, only an introduction to the problem of adequately controlling and conserving land and water resources. The necessary program for the accomplishment of this purpose is an enormous one, and will necessitate the coordinated mobilization of all efforts -- national, State and local. As stated by President Roosevelt in transmitting the report entitled Little Waters to Congress:

> "The report points out that we can have no effective national policy in these matters (of water resources), now in the closely related matter of proper land uses, until we trace this running water back to its ultimate sources and find means of controlling it and using it. . . . . we must have, literally, a plan which will envisage the problem as it is presented in every farm, every pasture, every wood lot, every acre of the public domain.
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> The Congress could not formulate, nor could the Executive carry out the details of such a plan, even though such a procedure were desirable and possible

under our form of government. We can, however, lay down certain simple principles and devise means by which the Federal Government can cooperate in the common interest with the States and with such interstate agencies as may be established. It is for the Congress to decide upon the proper means. Our objective must be so to manage the physical use of the land that we will not only maintain soil fertility but will hand on to the next generation a country with better productive power and a greater permanency of land use than the one we inherited from the previous generation. The opportunity is as vast as is the danger."

The problem of land and water utilization is national in scope. The Federal Government must assume the responsibility for the formulation of general policies and the coordination of erosion-control measures. At the same time, if private ownership is to be retained, national planning of this nature cannot hope to succeed without the active cooperation of individual farmers. To make the program effective, compulsory legislation by the States and smaller subdivisions will be necessary. The National Resources Board suggests that State legislation of this character might be encouraged through the extension of erosion-control aids to states enacting regulatory legislation. In 1936 the Soil Conservation Service submitted to the States a standard for a state soil conservation district law and implied that further Federal expenditures for erosion-control works within the states would depend upon the adoption of suitable State legislation. This standard law provides a procedure by which soil conservation districts may be organized, such districts to be governmental subdivisions of the State, and exercising the following powers:

1) The power to establish and administer erosion-control projects and preventive measures; to enter into contracts with farmers and give them financial assistance; to buy lands for retirement or project purposes; and to recommend land-use plans. These powers can

be carried out upon private lands only with the consent of the owner.

2) The power to prescribe land-use regulations in the interest of the prevention and control of erosion. Such regulations, however, must first be submitted to local referendum, and if approved in such referendum by a majority vote, these regulations shall have the force of law within the district.[42] Failure by land occupiers to observe the regulations is punishable by fine as a misdemeanor. Moreover, by order of the court, the supervisors may go upon his lands, do the necessary work, and collect the costs from the land occupier. To date, Texas is the only State which has enacted this standard law.[43] It is probable that other States will follow, however, especially if Federal assistance is made contingent upon such legislation. Two questions arise as to the possible success of this law; (1) will the majority of farmers in these districts deem it desirable to inaugerate a thorough-going soil conservation program;

42. These regulations may include provisions requiring engineering operations such as construction of terraces, check-dams, etc.; requirements for particular methods of cultivation, such as contour cultivating, lister furrowing, strip cropping, planting of trees and grasses, etc.; specifications of cropping programs and tillage practices, including rotations; and requirements that steep or otherwise highly erosive lands be retired from cultivation.

43. Wisconsin and Michigan have passed rural zoning laws, making it possible to restrict and determine the areas within which given forms of land use would be prohibited or encouraged. In Wisconsin, some five million acres of land have been zoned against agricultural development and placed in restricted forestry and recreation districts. No attempt has been made under this law, however, to change the method of agriculture or to force landowners to withdraw their lands from cultivation. In instances of isolated areas, the lands have been purchased by the State and the settlers have been relocated. No definite action has as yet been taken under the Michigan enabling act. Commenting on this law, Professor Herbert of the Michigan State College states:

"It is hoped that this state act will facilitate the withdrawal of marginal areas from agricultural production under the A.A.A. in addition to the usual benefits accruing to zoning legislation, such as lower governmental costs, more effective governmental service, protection of rural invest-

and (2) is such an act constitutional. Experience under the law will give the answer to the first question; but only the Supreme Court can answer the second.

Some students of this problem of land utilization have insisted that conservation, in the long run, is as desirable from the individual landowner's viewpoint as from that of society. In such case, all that is required to direct the activities of the land user to accord with the interests of society is a program of education. Such a statement, however, greatly oversimplifies the problem. A period of high food prices and rising land values such as occurred during the World War would inevitably make the prospect of immediate profit more attractive than maintenance of soil fertility. Furthermore, there are powerful economic factors such as the system of farming practiced, the size of the farm, extent of debt, and landlord tenant relations which force the injudicious use of land regardless of the consequences. A small farm tends to have the largest possible acreage in cultivated crops in order to utilize the family labor supply and obtain the highest possible output per acre. The corn-hog type of farming, which is directly related to the size of the farm, is not conducive to erosion control measures. A tenant operator, in general, has no specific interest in keeping up soil fertility. Tenancy has been steadily increasing since 1920, and has stimulated the rate of erosion. Short-term leases and crop-share leases also stress immediate productivity of the land and are unfavorable for conservation measures. The corporate landlord has no

(Cont'd) ments, eliminating of the exploitation of ignorant land users, concentration of rural settlement, all improving the social and economic status of the community." (Herbert, P. A., "Michigan Enacts a Rural Zoning Law", Journal of Land and Public Utility Economics, Vol. 11, (August, 1935), p.

permanent interest in the land, and is not concerned with the long-time farming program which is necessary for soil conservation. A high proportion of corporate land, therefore, tends to cause instability in land tenure and to foster erosion. Heavy mortgage indebtedness exerts financial pressure on the farmer which forces him to concentrate on immediate income and ignore the long-run effect of his farming practices. In some sections of the country, an effective erosion control program will reduce the number of farmers and laborers required. Some means of alternative occupation or supplementary incomes must be found in these cases. If the farmers are to cooperate of their own accord with the States and the Federal Government in carrying out an effective soil conservation program, the aggregate annual income of the farm must be maintained or increased. To accomplish this purpose, major readjustments must be made in the size of farms, debts, farm tenancy, the character of leases, and provision must be made for supplementary incomes, accompanied by a resettlement program.[44]

The need for protecting watersheds by the maintenance of adequate forest cover has been realized for many years, although there has been wide disagreement as to the effectiveness of this policy as a flood prevention measure. In the enabling act of June 4, 1897, providing for the establishment of the national forests, one of the purposes for such forests was stated as "securing favorable condi-

44. For a discussion of these problems see the Report of the President's Committee on Farm Tenancy, submitted in 1937; the Report of the President's Great Plains Committee, entitled The Future of the Great Plains, 1936; Woofter, T. J., Jr., Landlord and Tenant on the Cotton Plantation, Research Monograph No. 5 of the Division of Social Research for the Works Progress Administration; Ayres, Quincy C., Soil Erosion and Its Control, McGraw-Hill Book Co., 1936; and Bulletin No. 333 of the Iowa Agricultural Experiment Station.

tions of water flows."[45] As in the case of all attempts at conservation of natural resources, there was bitter local opposition to the establishment of the national forests. This was considered undue discrimination, prevention of the use and development of the public domain, and destruction of the potential wealth and prosperity of the western states. This opposition was changed to support, however, by the construction of roads in the forests at national expense and the adoption of the policy that twenty-five per cent of the gross receipts from the forests should go to the counties in which they are located. States are now clamoring for the establishment of national forests within their boundaries. The cut-over private land problem has made the national forest acquisition program a welcome one by the States.

The Weeks Act of 1911 provided for the acquisition of lands either by direct purchase or exchange of forest lands or timber rights for the purpose of preserving the navigability of streams.[46] To June 30, 1932, the Forest Service had established twenty-one of the so-called water shed units, the primary purpose of which is the prevention of soil wash and the control of stream flow. The national and state forests have many uses which are intimately related to the proper development of water resources and the utilization of land, including timber cutting, livestock grazing, water supply for domestic, irrigation, and power purposes, recreation, and game and wildlife conservation. These uses must be carefully balanced and correlated to obtain the greatest net public benefit. Unity of purpose and undivided control and responsibility are, consequently, indispensable in the management of the reserves.

45. 30 Stat. 34.
46. 36 Stat. 962.

In order to stimulate the development and proper management of State forests and to coordinate State and Federal activity in carrying out a comprehensive national program of forest land management, the Secretary of the Interior was authorized in 1935 to enter into cooperative agreements with the States. In order to be eligible for Federal assistance, certain requirements were exacted of the States with regard to the establishment of a coordinated forest policy and provision of efficient standards of forest management. The total appropriation for this purpose, however, was limited to $5,000,000.[47] The Copeland Report of 1933 recommended an increase in public ownership of forest areas of approximately 234,000,000 acres; more intensive management of certain forest areas; and the study of each particular forest reserve to provide for the fullest and most beneficial uses.[48] The National Resources Board recommended an increase in public ownership of about thirty million additional acres.

The greatest problem of forests and watershed coverage at the present time is that of the privately owned lands. These private holdings are being rapidly depleted, after which the owners and lumber companies depart, leaving cut-over land and a population without any means of support. It is highly essential that proper forest management be applied to these holdings which will result in sustained yields. Before this can be accomplished, however, changes must be made in State taxation policies, the debts on these lands, and, most difficult of all, the attitude of the people that ownership of land carries with it the right to mistreat and destroy their

47. 49 Stat. 963.
48. A National Plan for American Forestry, Sen. Doc. 12, 73d Cong., 1st sess.

land, regardless of the effect on national welfare.[49]

The rehabilitation of marginal farms and resettlement were carried on to some extent by the Federal Emergency Relief Administration, as a preferable method of providing for these farmers than direct relief. A Subsistence Homesteads Division was also established in the Department of the Interior which planned some sixty-six garden type of homestead communities. In 1933 all of these activities were taken over by the Resettlement Administration. The activities of the Administration with regard to submarginal farms have been entirely voluntary. Lands which are not suitable for cultivation are purchased from the farmers and adopted to more suitable utilization. In the state of New York, for example, all such land purchased by the Resettlement Administration has been taken over by the State Conservation Commission for wildlife areas. The subsequent use and disposal of such land is, of course, a vital aspect of a resettlement program and calls for a definite national policy for land utilization. As of April 15, 1936, the Administration had made contracts to purchase approximately 8,500,000 acres of such land.

In some cases, the farmers have been resettled in various parts of the country on individual farms. In others, the policy of resettlement in community groups has been adopted. The most difficult problem with regard to the latter policy is that of the government of the community and its relation to the local and Federal Governments. There is danger that such communities will lean too heavily upon the Federal Government for assistance, as the irrigation projects have done. This problem is equally applicable to the subsistence

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49. The problem of privately owned forest lands is discussed in the report of the National Resources Board, 1934, op. cit., and the report of the Pacific Northwest Commission, op. cit.

homestead program.

As of August 1, 1935, the Resettlement Administration had twenty-two subsistence homestead projects under construction, at various stages of completion. All of these projects had been initiated by the Department of the Interior. Forty-six other projects were under consideration. Homes are constructed by the Federal Government and agricultural supervision is supplied. Some of these projects were selected on the assumption that industries would be attracted to the location after the project was completed. Experience has since belied this assumption, and Dr. Tugwell stated in 1935 at a hearing before a special committee on land and water policies that in the future no projects would be adopted until definite assurance was received that industry would locate there.[50] The policy of subsistence homesteads is still very much in the experimental stage, but the purpose and ideal of the program is indicated by the National Resources Board as follows:

> "The integration of agricultural and industrial employment by the establishment of homes for workers employed in non-agricultural occupations where they may produce part of their living become a permanent national policy; and that this policy be broadened to include: Encouraging the location of industries, under proper conditions, in rural areas not seriously deficient of sources of income; reconstruction of existing rural industrial communities, which under laissez-faire policies took the form of wretched homes huddled around a mine or a factory; planning for the integration of agricultural and industrial employment in the case of relocating industries; encouraging the location of industries on the periphery of large cities in definite relation to rapid-transit facilities to the countryside, as an important objection in city and regional planning; and developing the program of public-land administration with the definite aim of integrating employment on public lands with employment in agriculture."[51]

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50. For the purpose of the resettlement program and activities of the administration see the Resettlement Administration Program, Sen. Doc. 213, 74th Cong., 2d sess.
51. Report of the National Resources Board, 1934, p. 20.

Navigation, irrigation, power and flood control in the comprehensive plan of development.

A comprehensive plan for the conservation and proper utilization of water resources must take all these problems of land and water use into consideration. The logical unit for such a plan is the drainage basin, although certain aspects of such a regional plan can only be determined in conjunction with national policy. In this coordinated plan, all projects for navigation, irrigation, power and flood control would be coordinated with a view to obtaining the maximum social benefits from the available resources. The improvement of rivers for navigation will depend not only on the need for such transportation in the particular region, but also on the possibility of securing a navigable channel for water transportation as one aspect of a multiple purpose project for flood control, storage for irrigation, power or domestic supply. Furthermore, all such regional projects for navigation improvement would be definitely related to a regional and national plan of transportation facilities, including waterways, highways and railways. In many instances, adequate flood control can be easily and reasonably provided by increasing the storage capacity of reservoirs intended primarily for other purposes. In other cases, the storage reservoir will be primarily for flood control, but incidentally power may be developed at certain times of the year.

In a coordinated program for land and water utilization, reclamation is viewed as an integral part of national land policy and the resettlement program. The reclamation of wet lands is also coordinated with irrigation policy. By reclaiming fertile lands, either by means of drainage or irrigation, those farmers who are now living on submarginal lands can be given the opportunity to maintain

a much higher standard of living in pleasant social surroundings. It is estimated that future needs for agricultural lands within the next twenty-five years may be partially met by bringing under cultivation three million acres by irrigation and ten million acres by drainage. If this is done, a national land reclamation policy is highly essential. As stated by the National Resources Board, "such a policy should be national in scope because it is intimately related to the economy of water use in deficit areas, to flood control and power policies, and above all, to the need for a planned provision for our agricultural land requirements."[52] The changing attitude with respect to irrigation is indicated in the following recommendations of the Board with respect to future reclamation policy:

1) In the arid sections of the country a comprehensive plan for the complete development of the water resources should be immediately prepared, and no projects authorized which conflict with this plan.

2) There should be State participation in planning and developing reclamation projects.

3) Consideration should be given to the facilitation of many small reclamation undertakings which, though individually local in character, are, in the aggregate, of considerable importance.

4) That, in the case of expenditure of Federal funds there should be a national benefit, as well as regional and individual benefit, and that not only farmers but also other individuals and the communities benefited by the project be required to incur obligations commensurate with these benefits.

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52. Report of the National Resources Board, 1934, p. 18.

5) That no Federal project involving reclamation of land for agricultural purposes be undertaken until its economic feasibility and advantages have been considered by the Departments of the Interior and Agriculture, in conjunction with a coordinated planning agency for the proper utilization of land.

6) That in view of the serious mistakes made by uncontrolled private enterprise in the development of drainage and irrigation projects on the basis of speculative and promotional considerations, that the interests of farmers settling in such areas have been injuriously affected, that the Federal Government has subsequently been called upon to refinance such areas and to provide relief, and that some futile drainage enterprises have destroyed valuable refuges for wildlife, the Federal Government should require the development of such projects to comprise an essential part of a national land use plan arrived at by a proper coordination of the various major forms of land use so that the Nation may take the proper precautions to prevent the development of ill-considered projects and may direct agricultural expansion toward areas of lowest capital costs in relation to the utility of the land involved.[53]

The greatest opposition to the unified planning for water resources arises in connection with the power aspects of the program. The necessity for a comprehensive plan in order to realize the maximum potential power of a stream has already been considered. The results achieved under the Federal Water Power Act have also revealed the necessity for unified ownership and control over water power projects. Under individual private ownership, any particular water power site may not be a profitable undertaking because of the variation of stream flow; or, if profitable, the site will probably not

53. Ibid., p. 19.

be fully developed. For example, consider a site located on a tributary of an important river, located in a region of heavy rainfall, and possessing large storage capacity. Under private ownership, such a site will be developed to meet the needs of that particular enterprise. Although the Federal water power act provides for headwater storage charges, this private management will not invest money in the construction of a high dam and creation of a large storage lake beyond its own needs on the mere chance that such stored water might on occasion be used by downstream plants, in which it has no financial interest. If there were only two or three plants on the river, such cooperation might be achieved. But with many plants on the various tributaries as well as the main stream, any possibility of voluntary cooperation is eliminated. Furthermore, any degree of connection between the various plants is extremely unlikely. Under unified ownership, all plants and storage reservoirs will be operated to secure an even flow and realization of the maximum power development. All such plants in the system will be connected to supplement any power deficiencies. Cost of generation can be cut to one-half to two-thirds of the cost under individual private ownership. Such a unified system must be under governmental ownership. Considering the power aspects alone, the complete control of the water power of the drainage basin by a private enterprise would put far too much economic power over the lives of the people of the region. In most cases, however, navigation, irrigation, flood control, and other aspects of water utilization can be combined with the power development. Wherever storage reservoirs are to be operated for a variety of uses, government ownership and operation is essential.

The second aspect of power development in a unified regional plan is the formulation of policy with respect to the distribution of such power. If the maximum regional and national benefit is to be realized from the use of this power, it is apparent that the policy to be adopted for the sale of power should strive to (1) make rates similar over large areas; (2) pass along the economies in the production of the power to the ultimate consumer; (3) increase consumption of electrical energy by farmers and domestic consumers; (4) provide for the location of new industries which is in accordance with the regional plan for decentralization; and (5) prevent the disruption of existing industries and communities, except insofar as may be deemed essential to the future welfare of the region.

The first essential for the fulfillment of these conditions is a central grid system, whereby the water power plants will be interconnected with both private and public hydro and steam plants in the region. The advantages of this interconnected system, as discussed in the report of the Pacific Northwest Commission, are as follows:

a) Existing and future plants with widely divergent electric and load characteristics can be interconnected. All plants feed directly into the major network over transmission lines to the major power grid points, which results in a more adequate and flexible supply of firm power and a greater use of facilities for generation, transmission, and distribution of power.

b) The different generating plants in the system not only supply current to certain points of the network, but serve as a means of maintaining constant voltage which reduces the total investment.

c) The demand of future loads can be met by the extension of main transmission lines from the network.

d) The system is flexible enough to permit changes or the removal of lines and generating facilities without interrupting the power supply.

e) The total investment in generating and transmission equipment is materially reduced.

f) The system is more reliable and transmission losses are reduced.

g) There is a greater opportunity for diversification and decentralization of industry through the wide distribution of power.

h) The grid system permits the full utilization of power which is developed in conjunction with navigation, reclamation and recreation purposes.[54]

In the first of a series of power studies made by the Federal Power Commission in 1935 it was determined that there will be a serious shortage of power in all sections of the country upon the resumption of normal industrial activity.[55] The demand for power is steadily increasing and private companies have installed very little generating capacity since 1930. Moreover, this shortage of power is accentuated by the fact that inefficient, obsolescent plants are now being used which should be scrapped. The Commission made a complete survey of existing facilities to determine the most economical method of meeting increased power demands, and to lay the foundation of a national power policy which looks to coordination of facilities.[56]

54. The Columbia Basin, op. cit., pp. 41-45.
55. National Power Survey, Power Series No. 1, Federal Power Commission, 1935.
56. "Careful planning under Federal supervision of new power plants and facilities for transmission is required to promote the safety and welfare of the Nation. Selection of sites for hydro and steam plants, to be developed either by public or private agencies, should take into consideration not only the pertinent engineering and economic factors but also essential consideration of broad national policy." (Ibid., p. XI)

An inventory was made of the Nation's undeveloped water-power resources in their relation to markets and facilities for producing power.

In connection with the problem of a uniform grid system, interconnecting both public and private facilities, the Commission determined that the installation of a considerable part of the new capacity required to meet the approaching power shortage could be avoided by the interconnection and coordination of existing facilities. "By this is not meant the mere physical interconnection of two or more separate systems, but proper coordination and unified operation of the properties."[57]

> "When attention is directed also to the fact that savings of millions of dollars a year could be effected through suitable interconnection and coordination of the Nation's power facilities, the economy of such a procedure is strongly emphasized."[58]

It is also a significant fact that the Commission found that the development of the power industry in the northeast section of the country had been substantially in accord with the plan developed by the Northeast Super-Power Committee of the Federal Government in 1923. Large savings were effected through interconnection of facilities but "they were not passed on to consumers because no adequate method of governmental control had been provided."[59] This would indicate that the transmission grid, such as proposed by the Pacific Northwest Commission, must be owned and operated by the Federal Government, if the economies of production are to be realized by the consumers.

57. Ibid., p. 30.
58. Ibid., p. 55.
59. Ibid., p. 55.

In the recent proposals for regional and national planning for a more beneficial utilization of land and water resources, cheap power serves a dual role; first, in improving living standards on the farm and in the home; and secondly, in attracting industry to the region and offer a better balance between agriculture and industry. On the other hand, there is a strong attraction, as has been noted in regard to irrigation policy, to maintain high power rates in order to make these multiple purpose projects self-liquidating. Such a policy not only finds political favor, but is also supported by the private power interests. It is essential, therefore, that a definite national policy be formulated with respect to the distribution of power from government multiple projects which will yield the maximum benefits throughout the region.

The most significant aspects of a national plan for land and water utilization are the concepts of social welfare and the role of the government in the economic system on which this plan is based. Public welfare, of this and following generations, is the goal and purpose of such planning. The resources of the nation are to be improved and replenished under the supervision of governmental agencies rather than impoverished and destroyed for the purpose of immediate and individual profit. All private individual interests are subordinated to the national interest. Private interests, acting under the stimulant of profit, are no longer identified with the public welfare. Wherever they may harmonize, or can be made to do so, private interests will be unaffected. In case of conflicts, however, individual interests must give way to broader consideration of the public benefit. To the government the task is delegated of ascertaining the public welfare in the use of land and water, of formulat-

ing policies for the direction of the activities of individuals, and the enforcement of such policies. Emphasis is placed on direct, either voluntary or compulsory, cooperation rather than on competition, and the indirect cooperation achieved through the mechanism of the price system. Other aspects of utility and welfare will be considered than those which are directly reflected in the price system and which are ascertainable in monetary terms. From a negative role in free private enterprise, the government must assume the leadership and be the directive force in a planned economy.

Recent Studies on Comprehensive Development of Water and Land Resources

The establishment of the Federal Employment Stabilization Board gave immediate impetus to the creation of State planning organizations to prepare plans for public works within each State. The creation of the National Resources Board gave this movement further impetus in the direction of permanent planning boards, removed as far as possible from political influences, to consider not only plans for a public works program but also such problems as land utilization, transportation, housing, population and social surveys, conservation of resources, recreation, distribution of industry, and development of water resources.[60] By June, 1935, state planning

60. The National Planning Board, predecessor of the National Resources Board, suggested to the Governors of all the States that state planning organizations would not only be beneficial to the states but would provide a means of contact with the national board and public opinion in the states. Furthermore, the Public Works Administration alloted funds for the employment of consultants to be assigned by the National Planning Board to qualified State planning agencies. As conditions for such Federal assistance, the Governors were required to give assurances that they would sponsor legislation to make the state planning board a permanent agency, develop a planning program for public works, land use and possibly integration of transportation, and agree to appoint a state representative on a Regional or Interstate Planning Committee. (See the report of the National Resources Board on State

boards, with varying degrees of permanence and authority, had been set up in every state except Delaware and Louisiana.

As yet, these state planning boards have done little more than to assist in the selection of public works for emergency reemployment purposes and to make studies of problems as a basis for formulation of future policy. The state reports with regard to water problems have generally recognized that drainage basins rather than states are the appropriate units for handling such problems. Water resources have been studied by these planning agencies in relation to other kinds of resources, recognizing that a water conservation program must be properly coordinated and interrelated with plans for land use, forestry, health, recreation, game management, agriculture and soil erosion. Investigations have been made by these planning boards of urban and rural water supplies, both as to extent of the supply and probable future needs; the quality of the water; the extent and source of stream pollution and its effect on fish life and the supply of water for public and industrial purposes; flood control problems; the need for conservation of water; possibilities of irrigation and hydroelectric developments; and recreational opportunities. Studies have been made to determine the most logical uses of land throughout the State and some progress has been made in the determination of submarginal areas and considerations of suitable resettlement areas.

In addition to state planning, a move has also been made in the direction of interstate planning with regard to some of these problems. The New England states have discussed regional planning and several attempts have been made to organize an interstate commission for that purpose. With the cooperation of the National Resources

(Cont'd) Planning - A Review of Activities and Progress, 1935.)

Board, the New England Regional Planning Commission was organized in 1934. Of particular interest are the studies of this commission on interatate stream problems, covering the Connecticut, Merrimack, and Blackstone River drainage basins. A similar regional planning commission was established in the Pacific Northwest, consisting of representatives from the states of Washington, Oregon, Montana and Idaho. The report of this commission on the Columbia Basin throws considerable light on the purposes and need for regional planning and also its practical limitations at the present time.

More thorough studies and plans for future development have been outlined for the Mississippi and Tennessee Valleys. The unified plan for the Tennessee contemplated a series of high dams which will provide a nine-foot channel from the mouth of the river to Knoxville, a distance of 650 miles. This waterway can be extended at any time that economic conditions warrent the expense to include the main tributaries. The plan also includes three large storage reservoirs on the tributaries which will aid materially in maintaining a uniform stream flow and reducing floods. Control of this system of dams will contribute to the control of the Mississippi floods. Provision is made at all the dams for the maximum development of power whenever the demand is sufficient to require additional power. These plants will be connected by transmission lines in order to utilize all the potential power. The complete plan, therefore, will yield the maximum amount of navigation, power and flood control. Additional aspects of the comprehensive program include protection of fish and wildlife, the protection and development of recreational possibilities, malaria control, the conservation of groundwater and rainfall by cultivating the habit of control

on the part of farmers and landowners, the prevention of soil erosion and the maintenance of adequate coverage to conserve both water and soil. The ultimate purpose of this program is the general well-being of the people in the Tennessee Valley, and the policies to be adopted for the distribution of power from the project and the use of the waterway for transportation will be directed to achieve this goal.[61]

The report of the Mississippi Valley Committee is the most thorough-going and complete study that has ever been made of any river basin. It considers all of the interrelated uses and problems of water utilization which have been discussed in this chapter. In the letter of transmittal to the Administrator of Public Works, the Committee stated that it had "endeavored to bring into common focus many phases of the subject which usually have not been treated in their relations to each other."[62] The Valley was divided into five

61. The Unified Development of the Tennessee River System, by the Tennessee Valley Authority, March, 1936.

62. The scope of the study is indicated by the Committee as follows: "The divisions into which the Mississippi Valley Committee was found, by the sheer logic of the situation, to analyze its problem will indicate the amazing diversity of the task of using and controlling water. Flood control, low water control, navigation, power, water supply, sanitation and erosion are integral parts of the picture. All of these elements are met with in the Great Valley. All of them may be encountered in the treatment of a single stream.

Merely to list them is to suggest that we cannot plan -- that we can hardly hope to develop even a single sound project -- unless we study also the uses of land. So we have other factors we cannot overlook; agriculture and irrigation, industry and commerce, water storage, forestry, recreation, the conservation of wildlife. Every plan and detail of a plan must be checked against as many of these factors as are pertinent to the particular case if we are to be certain of wholly beneficial results. . . . . .

The problem of control involves not only the physical nature of the stream, but the often conflicting claims of various uses and various users. Scientific planning requires a use pattern for each community, district, or region, as well as a geographical pattern which will reflect as fairly as possible the dominent needs of each locality." (Report of the Mississippi Valley Committee, 1934, p. 3.)

basins,[63] and the needs of each region for complete development of water and land resources were considered, including reclamation of productive agricultural lands, classification of lands for the proper use, erosion and flood control, multiple purpose reservoirs, interconnection of power facilities, and many others. A number of reclamation and rehabilitation projects were recommended by the Committee for immediate consideration, in the Yazoo, the St. Francis and the Black River Basins,[64] the Ozark Highlands,[65] and the Black Hills Uplift. In the ultimate development of the entire Valley, as visioned by the Committee, all lands will be devoted to their most scientific use -- various kinds of crops, pasture, forests, recreation and wildlife -- the rivers will be controlled insofar as possible and utilized in many ways; and power lines would have flung an

63. The Upper Mississippi, the Ohio, the Missouri, the Southwest (including the Red, Arkansas, White and Ouachita Rivers), and the Lower Mississippi.

64. The proposed development of these river basins as outlined by the Committee clearly illustrates the changing concept of the responsibilities of the government in the economic and social order.

"The investigations should include study of the soils throughout the area, determination of the best system of cropping and farm management and a thorough consideration of the best means for developing the highest and most desirable type of community and social life. . . . . The completed plan should not only cover all the engineering and economic features of the project, but should also provide for the administration of a land settlement program including the qualification of settlers, financing the purchase of land from private or public agencies, financing the construction of dwellings and the purchase of equipment, and aid in developing an appropriate type of farming." (Ibid., p. 211.)

65. The Ozark Highland project is a very comprehensive plan for the social and economic reconstruction of the region, including erosion control, withdrawal of lands from cultivation, flood control, generation of water power, stimulation of lumber production and the promotion of the recreational use and value of the country.

intricate, interconnected network over the whole region.

> "The economic life of the region, being better organized, would be carried forward on a higher level. . . . The 'sturdy individualism' of pioneer days would have been restored by the cooperation of national and local agencies, some governmental, some private, but it would be a cooperative, not a combative individualism. . . . The nation can create such a Mississippi Valley as has been outlined if it collectively so wills."66

The above considered activities of the Federal and State governments are but an approach to the whole problem of proper land and water utilization. In addition to establishment of adequate erosion control measures throughout the country, the resettlement or rehabilitation of marginal and submarginal farms, and the conservation and proper utilization of water, our future national land and water policy should also include the withdrawal of Federal lands from homestead entry, selective laws with regard to State lands, the classification of lands by governmental agencies according to problems of proper utilization, the zoning of rural land use, the consolidation of farm holdings, the reduction of farm tenancy, the direction of future industrial development, and the cultivation of the habit of water conservation by property owners throughout the country. Such a program, which involves complete planning and direction of the utilization of our most fundamental natural resources, land and water, will necessitate complete and intelligent cooperation of all governmental units, property owners and business interests.

The Problems of Regional Planning for Land and Water Use.

Planning for land and water use, on a scale as suggested by the Mississippi Valley Committee, presents many problems which must be met before it can be successful. In the first place, the scope of the subject and the complexities of the numerous interrelationships

66. Ibid., p. 231.

and conflicts in land and water utilization present many difficulties. There is a question as to how far a plan for any region of the country should attempt to include all aspects of the subject. Certain aspects of the program, such as erosion control, flood prevention and stream pollution should be undertaken immediately in some drainage basins. Other parts of the complete development, such as power production and land reclamation may be delayed for a while. Unless the completed plan is envisioned at the start, however, serious mistakes may be made which will result in wasteful expenditures. On the other hand, the plan of development cannot be too rigid. It must be sufficiently flexible to meet dynamic changes in the social and economic order. Moreover, the boundary lines of the region must be flexible. In some respects, the watershed is the proper unit for planning. In other regards, however, the plan must be of broader scope. Wherever power is to be developed, for example, the entire area within economical transmission distance must be taken into consideration in determining power policy. This area will not coincide with the drainage basin. Furthermore, it must be remembered that the particular region cannot be considered as an isolated area. The stimulation of industrial and agricultural development is one part of the country will affect other sections. The determination of the growth of population and the markets for power, farm products, raw materials, and manufactured goods can be estimated only in the light of national development and the plan for other regions.

These complexities and interrelationships of regional plans are closely related to the second problem in planning -- that of administration. The Federal Government has been generally conceded to be

the proper agency to make all preliminary surveys and studies, and draw up the proposed program of development. What agencies, however, shall be charged with the administration of the actual operation of the various aspects of the project -- the Federal, State or local governments, or private interests? Here, again, there is general agreement to the extent that all these agencies and interests must cooperate. It can be anticipated, however, that localities, states, private interests and landowners will serious object to the plan wherever it may involve a curtailment of political power, reduction of taxable property, or conflict with the opportunities for private gain. As has been clearly stated by the Pacific Northwest Commission, one of the greatest obstructions to effective regional action "comes from tensions due to local rivalry which frequently have aligned one city against another, the small town against the metropolis and one irrigation district against its fellow. These tensions are byproducts of the struggle for the advantages anticipated from the growth of population, from the benefits of public works, and from the expansion of the economic and social life of the region.[67] . . . . There appears to be a constant tendency for an economic system based upon the principle of private enterprise to produce cleavages that impede the growth of regional community feeling."[68]

The extent to which various aspects of the plan can be delegated to the different governmental units and private individuals and successfully administered by them can probably be ascertained only by actual experimentation. It must be fully recognized,

67. The Columbia Basin, op. cit., p. 11.
68. Ibid., p. 130.

however, that national planning cannot be successful if the complete responsibility for the operation of the project is put on the Federal Government to be enforced by compulsory action. Public opinion must be in favor of the general program. Without cooperation from the people, both individually and through their local governments, the full purpose of planning cannot be achieved. One cannot be too optimistic about regional planning for social welfare. Much of the apparent support which it received during the depression was based on the desire of private interests for the increase of wealth from the construction of public works and expenditure of Federal funds within the localities.[69]

The ideal of a planned economic order, which attempts to direct all lines of action to focus on a common social objective, cannot be realized until certain fundamental attitudes of mind are discarded. It is still generally believed, for example, that science can conquer the forces of nature; that natural resources are inexhaustible; that markets will expand indefinitely and values will continue to rise; that the self-sufficient farm is desirable; that habitual practices are best and all adjustments should be made by individuals; that

69. After surveying public opinion in the Pacific Northwest, the Planning Commission stated that "the committeemen identified with the subcommittees on Industry and Commerce have not been interested even in open discussion of social controls in those directions. Their basic assumptions are incompatible with social planning. They assume that balance in industry means more manufacturing of products which are now being imported into the region. They are unwilling to make any corresponding diminution in the volume of exports from the region. They are concerned with more population without much regard for the level of living standards that populations have except insofar as immigrants may become public charges. Nor have they indicated much concern withthe problems of increasing the living standards of the present inhabitants, save those on relief. They assume the same business methods and desires for industrial management." (Ibid., p. 152.)

farm tenancy is just a step toward ownership; that individual and social good are identical and that free competition will coordinate industry and agriculture.[70] It is not sufficient merely to demonstrate the falsity of these beliefs, for, unfortunately, there is not only the intelligent, thinking class of people to deal with, who could be educated in time to a better conception of the facts, but there is that large group of individuals who will take a catchword and fight a good measure with no understanding of its purpose and significance. The opposition of this group will undoubtedly by stimulated by private and political interests who fear a loss of power or opportunity for financial gain under a planned economy.

Closely connected with the problems of administration are the legal aspects of national planning for water and land use. Our dual system of government, with its constitutional limitations on the power of the national government will add to the difficulties. The advocates of states' rights will continue to fight any extension of Federal authority. And they will find allies in private business interests, who have always used the constitution as an effective argument to block undesirable Federal legislation. Unfortunately, the constitution makes no provision for the conservation of natural resources and amendments may be necessary to give the Government adequate control over the uses of land and water resources before national planning in that regard can be effected.

The problem of allocating the costs of multiple purpose projects among the various uses in another different one. The Mississippi Valley Committee has recommended that the ideal allocation of costs is in accord with the benefits received by all private individuals

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70. See The Future of the Great Plains, op. cit., for a discussion of these beliefs.

and groups, and by each governmental unit. The attempt to realize this ideal is impossible, however, for the costs are to a large extent incurred jointly and cannot be allocated to any specific use of the facilities of the projects. Furthermore, the benefits of the project include not only directly ascertainable values to any individual or any particular section of the country, but also a great variety of indirect and intangible factors. The extent to which these intangible items should share in the total cost of the project depends primarily on the concept of national interest, or the relation of benefits to the public welfare. The problem of allocating costs will necessitate an entirely different concept of benefits, values and costs than those found in commercial enterprise. The principles of social accounting must be clearly differentiated from the cost accounting of private business. Public policy as to the distribution of power and the use of water from Federal multiple purpose projects will depend, in large measure, on the allocation of these costs.

A start in the direction of multiple purpose projects for a more complete utilization of water resources has been made by the government in the Boulder Dam and the Tennessee Valley Authority projects; also at the public works projects at Grand Coulee, Bonneville and Fort Peck. In addition, there are other contemplated multiple purpose projects, such as the St. Lawrence Seaway, and programs for the development of the Mississippi and its tributaries, the Connecticut and the Potomac Rivers. These Federal undertakings have often been cited in the past few years as the forerunners of complete regional planning for water and land utilization. The second part of this study, therefore, will be devoted to an analysis of these projects.

In particular, attention will be given to the reasons for the adoption of these projects by the Federal Government, the nature of the opposition to their adoption, and the manner in which the problems of regional planning have been handled (or are proposed to be handled) in the formulation of policy and the administration of the undertakings.

CHAPTER VI.

DEVELOPMENT OF THE COLORADO RIVER

The Colorado River, which drains the Southwest section of the United States, is probably the most remarkable river in the country. Seven states are included in the drainage basin,[1] which covers an area of 244,000 square miles and includes a great variety of topographical and climatic conditions. The upper section of the river drains the high country of the Wind River and Rocky Mountains, which furnish the greater part of the water supply. The lower third of the basin is composed primarily of hot, desert plains which are close to sea level. Part of this area is very fertile and can be successfully cultivated by irrigation. The central portion of the basin is a high plateau, through which the stream has cut narrow canyons of great depth. The Grand Canyon is the best known, as it is the largest of the canyons and has been developed as a recreational center. There are, however, many other canyons of considerable depth on the main stream and the tributaries. The fall of the river in this section of the basin, combined with the canyons, present an ideal opportunity for great power developments. Between Green River, Utah, and Parker, Arizona, there are at least twelve favorable dam sites where a continuous development of over four million horsepower can be developed. As to potential power, the Colorado is surpassed only by the Columbia and the St. Lawrence Rivers.

Cheap power also opens up possibilities for the development of electrochemical industries which require large quantities of power at low prices in order to compete successfully with foreign pro-

1. Namely, Utah, Nevada, Wyoming, Colorado, New Mexico, Arizona and California.

ducers. For example, at the present time large quantities of fertilizer from Chile and Germany are now being shipped at high rates into the Colorado River Basin. The ports of Los Angeles and San Francisco report large quantities annually. With an adequate source of power, much of this business may be recaptured by domestic manufacturers. Industry in the Pacific Southwest has been rapidly expanding, and with the coordination of railroad facilities, the reduction of rates, and the development of power and raw materials, there are possibilities of considerable expansion. The region has long been an important recreational center. The development of national parks and forests and the construction of adequate highways, as well as the publicity and advertising of the railroads, resorts and towns, have attracted an increasing number of tourists annually.

This part of the country is sparsely settled, but its population is growing much faster than the rest of the country. Agriculture is the major source of income for the entire region. Intensive cultivation of specialized crops is carried on in small areas wherever water is available for irrigation, and stock is extensively grazed on the dry plains. Both types of agriculture have given rise to difficult problems and the need for coordinated planning. Early developments in irrigation were largely unplanned. Areas were developed wherever the water could be easily and cheaply diverted and applied to the land by individuals, irrigation districts, and the Federal Reclamation Bureau. At first these areas served only the local markets. With increased transportation facilities, however, including the refrigeration cars, the market area gradually widened to include the entire country, thus giving these areas a position in national agricultural development. In the case of certain products, the Southwest has at-

tained a leading position in national markets, such as barley, fresh fruits and vegetables from the lower basin; potatoes, celery, strawberries and cherries in the mountain states; and the citrus business in California. Stock grazing on the plains has created a serious problem of soil erosion. Herds have been concentrated on the good pasture land and, in many instances, the vegetation has been entirely removed, leaving the top soil exposed to the damaging effects of the wind.[2] In planning for the future development of the region, therefore, agricultural, grazing, and reclamation policies will be the basic factors.

In the mountain areas of the basin, mining is the important industry. Mineral resources are abundant in the region. In fact, the leading states in the country in the production of copper, lead, zinc, gold and silver, are in the Colorado River Basin. Moreover, there are rich areas in isolated parts of the region which have not yet been developed. Many of these areas have been handicapped because of high rates for freight and for power. The development of the power potentialities of the river will enable an expansion of the mining industry. A review of the possibilities of the Colorado River Basin reveals, therefore, that the river combines in proper sequence for complete use a large quantity of water, a great concentration of fall, reservoir sites for the control of flow, sites for power plants; that there are mineral resources in the upper basin, and several million acres of irrigable land below the stretch where power may be developed.

2. The Taylor Grazing Act of 1934, which limits the number of head of stock for any particular area on the public lands, will help this problem of overgrazing.

Background of the Boulder Canyon Project

Problems of the Imperial Valley.

The origin of the Colorado River development lies in the problems of the Imperial Valley, in the need for an adequate water supply and the menace of floods. The present Imperial Valley was at one time an arm of the Gulf of California, which was cut off from the main body of water by a delta of silt created by the Colorado River. The Geological Survey has estimated that the river carried some hundred million feet of silt annually to the delta, or an amount equal to two-thirds of the total material excavated in the construction of the Panama Canal. Six million average railroad cars would be needed to transport this material.[3] Through the course of time, this water evaporated, leaving only a remnant of the great inland lake in the present Salton Sea, and a large area of fertile land capable of a high degree of productivity under irrigation. As early as 1849 the idea of bringing water from the Colorado River into the Imperial Valley was conceived by a Dr. O. M. Wazencraft. In 1877 a study was made by the War Department of the flood conditions of the river and an investigation was made of a canal route to irrigate the Valley. The Colorado River Irrigation Company was formed in 1886 but failed, and was succeeded in 1896 by the California Development Company. This later company also failed, and was eventually succeeded by the Imperial Irrigation District.

The Development Company had diverted water from the river on the California side just above the Mexican border, and taken the canal through Mexican territory for a distance of sixty miles in order to

3. James, Henry F., "The Salient Geographical Factors of the Colorado River Basin", Annals of the American Academy of Social and Political Science, Vol. 135 (January, 1928), p. 101.

get around the shifting sand hills which separate the river from the Valley. In return for this concession, it was agreed that lands in Mexico should be entitled to one-half of the water passing through the canal, the water right charge to be determined by the Government of Mexico. A Mexican corporation was formed by the Irrigation District to maintain and operate the canal system in Mexico and it was agreed that all problems which might arise under the concession would be settled in Mexican courts without interference by the American Government.[4] During the same period a concession was made to a group of Los Angeles businessmen, the principal of whom was Harry Chandler, owner of the Los Angeles Times, for most of the land in Mexico susceptible to irrigation from the Imperial Valley canal. This land was worked by Chinese tenants. The existence of the canal in Mexico was a constant source of trouble to the Imperial Irrigation District. The American interests in Mexico did not properly maintain their irrigation works, they assumed no responsibility for the construction of levees and the removal of silt from the canal, and were not bearing their share of the cost of construction and operation of the irrigation works. The District repeatedly requested a revision of the rates by the Mexican Government, but the Chandler interests were much more effective in Mexican politics. Furthermore, the American Irrigation District could not increase its irrigable acreage without taking into consideration the right of Mexico to half of the total amount of water diverted from the river. It was this situation which led to the demands for an All-American canal, to be constructed by the Federal Government, but to be repaid

4. For a copy of the water concession see the hearings on H. R. 2903, The Colorado River Basin, before the Committee on Irrigation and Reclamation, House of Representatives, 68th Cong., 1st sess., p. 250-54.

by the District in accordance with the Federal irrigation policy.

The Colorado River, which flows along the eastern rim of the Valley, was a steadily increasing manace as well as the source of water for irrigation on which the inhabitants were dependent for a continued livlihood. The river deposited a large portion of its silt along its bed, raising the level approximately a foot per annum, so that it was flowing on top of a high silt ridge many feet about the Valley, which is many feet below sea level. The course was unsteady because of the steadily increasing silt deposits, and there was constant fear that the river would turn into the Valley. Protective levees were constructed along the lower river, but were not satisfactory and required constant attention during periods of high water.[5] With the increase in the level of the river there was a limit to the economic feasibility of levees. In 1905 the river broke through its silt ridge and flowed into the Salton Sink for eighteen months, which not only resulted in heavy property damage but cost the Federal Government four million dollars to control and confine the river within its banks.[6] In addition, the river was rapidly filling its last existing outlet to the Gulf with silt. The inhabitants of the Imperial Valley were, therefore, facing the prospect of complete destruction of their property when this depression was completely filled and the river would probably turn into the Valley.[7] The enormous quantity of silt deposited by the river also entailed considerable expense for continual dredging of the canals and distributing

5. The other irrigation projects on the river had also suffered serious flood damages, but received less attention than the Imperial Valley because they were not below sea level.
6. This work was done by the Southern Pacific Railway.
7. In 1922 an artificial outlet, known as the Pescadora Cut, was made. Engineers estimated that this would be filled with silt in approximately ten to fifteen years.

systems. The annual cost of removing silt from the irrigation ditches in the Valley alone was around $1,350,000.

It was this flood menace and the difficulties with Mexico over the water concession which led to demands for Federal action from the Valley. In 1907, President Roosevelt submitted a message to Congress which discussed the problems of the lower Colorado River and submitted an outline of desirable legislation to provide for an adequate water supply in the Imperial Valley, for domestic uses and irrigation purposes, and for flood control. No action was taken at that time. The continued difficulties of the Valley, however, led to a comprehensive survey of the river by the United States Geological Survey which was published in 1916, dealing with the problems of river regulation, irrigation, water power and silt control.[8] In 1918 a committee was organized at the initiation of the Secretary of the Interior and the Imperial Valley irrigation district to study the possibilities and desirability of an All-American canal. This committee made its report the following year, which recommended the construction of the canal. Legislation to that effect was presented in the Sixty-Sixth Congress and hearings were held at some length. By that time, however, other problems regarding the uses of the water of the Colorado River had arisen which greatly complicated the subject of protecting and aiding the Imperial Valley.

Interest of Los Angeles in the Colorado River.

In order to meet the water needs of its rapidly increasing population, Los Angeles had constructed a 250 mile aqueduct from the Sierra Nevadas to augment the local supply from wells and small

8. Water Supply Paper No. 395, by E. C. LaRue.

streams. This mountain supply was limited, however, because of the low flow during dry seasons and vested interests in the water for irrigation purposes. As the population of the metropolitan area continued to increase, investigations were made by the city to find an additional supply of water, and it was finally decided that the Colorado offered the only source. To be assured of a steady supply of water, it would be necessary to provide storage some place on the river. Furthermore, a large amount of power, approximately 350,000 horsepower, would be required to pump the water over the mountain ridges separating the river from the seacoast. The cost of the aqueduct was estimated at $150,000,000. In order to coordinate the needs of Los Angeles for domestic water with those of the Imperial Valley for flood protection and an assured supply of water for irrigation, a much higher dam with large storage capacity would be necessary.

The interest of Los Angeles in the subject did not stop, however, with the need for domestic water supply. The city owned its municipal electrical distribution system and supplied part of its needs from hydroelectric plants in the mountains and along the main water aqueduct from the Sierra Nevadas. The remaining portion of its power needs was secured from the Southern California Edison Company, which company, with its subsidiaries, had a monopoly of private power enterprise in the southern part of the state. The city paid a price for this power much in excess of the cost at the city plants and of the company's most efficient plants. Therefore, in connection with the project for flood control and domestic water supply, Los Angeles and the surrounding cities wanted a power development, in addition to that required for pumping purposes, to supplement power needs and

render them independent of the private power company.

Allocation of water.

By 1918 the problem of the future uses of the water of the Colorado began to assume importance, due primarily to the great variation in seasonal and annual flow. From flood stage to low water the volume of water varied from two hundred thousand to two thousand second-feet,[9] and from twenty-five million to nine million acre-feet[10] as between years. With respect to the rights of individuals, political units, or corporations to use this power, the doctrine of prior appropriation had been accepted by all the states in the Colorado Basin. The riparian water law of the East, derived from common law, had been abrogated in all these states except California, where both riparian and prior appropriation were recognized. Under the prior appropriation doctrine, whoever first applies the water to a beneficial use, either upon riparian or non-riparian land, acquires a vested property right in the water which is superior to all other claims. Rights in the use of a river are, accordingly, recognized in the order of their initiation until all the water of the stream, if nonnavigable, is appropriated. For many years there was uncertainty as to the status of interstate rivers. In the case of Kansas v. Colorado, the Court had intimated that there should be an "equitable division" of the water as between the states.[11] In 1922, in the case of Wyoming v. Colorado, however, the Court definitely stated that the law of prior appropriation should apply irrespective of state lines.[12]

9. A second-foot is a volume of one cubic foot passing a given point in one second.
10. An acre-foot is a volume of water sufficient to cover one acre one foot deep.
11. Kansas v. Colorado, 206 U. S. 46 (1906).
12. Wyoming v. Colorado, 259 U. S. 423 (1922).

By 1918 all the water at low flow had been completely appropriated and there had been periods of water shortage. Approximately 460,000 acres of land in the Imperial Valley were under irrigation, supporting a population of sixty thousand, with an assessed property valuation of one hundred million dollars. On the Arizona side of the river, directly east of the Valley, is an equally fertile section of approximately 110,000 acres known as the Yuma Valley, in which the Federal Government has an irrigation project. Other projects on both sides of the lower river included the Parker project, of 110,000 acres; the Palo Verde Valley, of 78,600 acres; the Mohave Valley, of 34,000 acres; and the Cibola Valley with 16,000 acres. In the upper states there was under irrigation from the tributary streams approximately 1,450,000 acres. Also in the upper states in the basin there was an additional 2,750,000 acres potentially irrigable land. Arizona had large acres of irrigable land, but it required expensive pumping and was not economically feasible at that time. The city of Denver was looking to the headwaters of the Colorado as a future source of additional water for its domestic supply.

Of all the states in the drainage basin, however, California was the only one with an immediate demand for the water of the Colorado River -- for additional irrigation in the Imperial and Coachella Valleys, for domestic water supply, and for power in the cities of southern California. If water were stored for these purposes, the flood water as well as the low flow might be completely appropriated, leaving nothing for the other states in the drainage basin. The proposals of the California interests were accordingly viewed with alarm, and there was a clamor for an interstate compact to allocate the waters of the Colorado, thereby altering the doctrine

of prior appropriation.

Because of these many complicating and conflicting interests in the problem of the use and development of the Colorado River, further information was considered necessary before deciding the question of the All-American canal and flood control. In 1920 the Kincaid Act was passed, directing the Secretary of the Interior to make a further investigation of the problems of the lower Colorado and report a proper plan of development.[13] A preliminary report, known as the Fall-Davis report, was submitted in 1922.[14] Legislation was introduced immediately, embodying the recommendations of this report for a large dam and storage in Boulder Canyon, which would prevent floods, control the silt, provide adequate storage for a supply of domestic water for the Los Angeles metropolitan area and for the reclamation of additional arid lands, and incidentally allow the generation of a large quantity of hydroelectric power.[15] This marked the beginning of a bitter six year fight regarding the Colorado River which led to open hostility between the states, brought the subject of public

13. The cost of this investigation was borne by the Federal Government, the state of Arizona, the Imperial Valley and the cities in California interested in the project.
14. Problems of the Imperial Valley, Sen. Doc. 142, 67th Cong., 2d sess.
The investigations of the Department of the Interior were continued and appeared in 1924 in the nine-volume Weymouth Report. This report has never been published, and there are only a few available copies. Three other water supply papers completed a detailed and authoritative survey of the Colorado River Basin; namely, Paper No. 556 by E. C. LaRue, Water Power and Flood Control on the Colorado Below Green River, Utah, (1925); Paper No. 617 by Robert Follansbee, which covered the upper Colorado River (1929); and Paper No. 618 by Ralf R. Woolley, which covered the Green River, (1930). Further studies have been made by the Reclamation Bureau under the Boulder Canyon Act considering various phases of Colorado River development.
15. H. R. 11449, 67th Cong., 2d sess.

versus private ownership of the electrical utilities to the foreground, and was complicated by difficult legal and international problems.

Bills were introduced in every session of Congress, by Representative Swing in the House, and by Senator Johnson in the Senate, both from California, from 1922 to 1928. Lengthy hearings were held, not only in Washington but also in the interested cities and districts in the Southwest, many surveys were made, and the debates in Congress fill hundreds of pages of the Congressional Record. The Boulder Dam Association was formed, composed of Imperial Valley interests, cities in Southern California, and veterans' organizations, which advocated the enactment of the Swing-Johnson bills and took an active part in arousing public interest in the Boulder Canyon project. The Colorado River Aqueduct Association was formed by those cities interested in a storage project for a supply of water for domestic purposes. The Colorado River Control Club, consisting of some of the landowners in the Imperial Valley, advocated flood control but was opposed to the All-American canal. The Arizona High Line Reclamation Association was opposed to all aspects of the proposed legislation and offered a substitute project. And the private power interests, although not openly organized in opposition to the project, engaged in an extensive campaign to defeat any proposal for the development of power sites by the Federal Government. A study of this fight for Federal action reveals many of the problems which must inevitably be encountered in any proposals for regional development of interstate streams and for multiple purpose projects, to be owned and operated by the Federal Government.

The Fight for Legislation.

The principal problems of national and social policy which were raised by this controversy over the Colorado River were as follows:

1) What are the rights of the States over interstate streams flowing through their territory;

2) Should the Federal Government engage in a project for local benefits;

3) What factors should determine the plan of utilization;

4) What should be the division of responsibility for the project and how should it be administered;

5) How shall the costs of the undertaking be allocated;

6) What is the desirable social policy as to the distribution of power;

7) The relation of such an undertaking to national reclamation and national flood control policy.

The question as to the rights of the states in interstate streams was, at least on the surface, the primary impediment to Federal legislation. Motivated principally by the fear that California would appropriate all the water and acquire a vested interest therein, requests were made to Congress by the other states in the drainage basin for privilege to draw up an interstate compact to allocate the water and thereby limit the operation of the doctrine of prior appropriation. A Federal law was passed for this purpose in 1921 and Secretary of Commerce Hoover was appointed the chairman of the interstate commission. After the first few meetings of this commission, it was apparent that no agreement could be reached on allocations by individual states. The basis of division was accordingly changed to basins; the upper basin including Utah, New Mexico,

Colorado and Wyoming; and the lower basin consisting of Nevada, California and Arizona. After many meetings it was agreed that the upper basin states should receive 7,500,000 acre-feet, with an equal amount going to the lower states plus an additional 1,000,000 acre-feet if available. This compact was signed at Sante Fe, New Mexico, on November 24, 1922, and then submitted to the respective State legislatures and was ratified by all but Arizona. In 1925 a six-state ratification was suggested. Inasmuch as this would put the whole burden of responsibility on California for appropriations by the lower basin states, with no limitations on Arizona, the state legislature refused to ratify the compact on such a basis except under conditions of adequate storage. Upon further consideration, Utah later withdrew from the compact.[16]

There is no question but that the Colorado River compact was predicated upon the necessity of satisfying the selfish desires of the individual states rather than upon the most economical plan of development or beneficial utilization of the river or the region. Each state in the basin wished to secure the greatest possible amount of water for future potential uses. No investigation was made by the interstate commission to determine the extent of these future uses, or of the engineering and economic feasibility of such projects for irrigation, power or domestic usage, to formulate a comprehensive plan of development and allocate the water accordingly. Furthermore, the compact bore no reference to any specific project. Its sole purpose was to prevent California and Mexico from acquiring additional vested interests in the available water supply.

16. The history and provisions of the compact are fully discussed in The Colorado River Compact by R. L. Olson, 1926.

Under the terms of the compact, the upper basin states were satisfied inasmuch as none of them had any immediate need for additional water. Arizona, on the other hand, was in a much worse position under the compact allocation for the total amount of water for the three lower basin states would be limited, yet the amount to be taken by California and Mexico was not limited. The doctrine of prior appropriation would prevail as between the States in each basin unless and until additional interstate compacts could be effected. Arizona accordingly demanded half of the water alloted to the lower basin after deducting 300,000 acre-feet for Nevada and the amount necessary to satisfy vested rights in Mexico. Furthermore, Arizona insisted that the right should be reserved to each state to decide the site for the storage and diversion of waters allocated to it, which would completely prevent all possibility of a comprehensive development of the drainage basin. California naturally refused to accept such an arrangement. Both on the basis of immediate and future use of the water, all of the studies revealed that California had need for a far greater supply than Arizona. The market for power was in Southern California, as well as the need for domestic water supply. As to future irrigation projects, the lands in California could be much more economically developed than those in Arizona.[17] The attitude of Arizona, however, is not exceptional.

17. The Arizona High Line Reclamation Association proposed that the storage dam be constructed at Glen Canyon, with a diversion dam at Bridge Canyon and a high line canal from which three million acres in Arizona could be irrigated. A small flood control dam was to be built at Topock. At the direction of the Association, an investigation of the project was made by two engineers, Sturtyvant and Stam, who made a very favorable report. They recommended the project as a substitute for that at Boulder Canyon, asserting that it would not only meet the requirements for flood control and domestic water supply, but would develop much more power and permit the development of a large area in Arizona. This report was

Instead, it is characteristic of the general attitude of the states toward each other, and brings out clearly one of the fundamental problems involved in regional planning for the most beneficial development of resources.

With the introduction of power as an important item of the proposed Federal project the opposition from Arizona was increased because Federal property would not be taxable. In this regard, Utah and Nevada also gave their support. The power sites on the Colorado represented a potential source of income, if developed by private companies, which the states refused to surrender. At the Denver conference in 1927, at which the seven states were represented, an agreement was reached, with the exception of California, that the states were the owners of the bed, banks and water of the river, that they could not be used or appropriated without the consent of the states, and that they were entitled to revenue from any Government project at least equivalent to the state tax rate. To satisfy this demand, Senator Pittman offered an amendment to the Swing-Johnson bill in 1927 that the states of Nevada and Arizona be given some compensation in return for the loss of potential revenue. This provision was retained in the bill as finally passed.

Wherever land and valuable resources are taken from private enterprise and developed by the Government for purposes of conservation or utilization for the public welfare, certain actual or potential financial losses are inflicted upon some localities. As in the case of the national forest reserves, it was necessary to grant the states a share in the net revenues in order to conciliate

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(Cont'd) reviewed by Government engineers and rejected as utterly fantastic because of the enormous expense of the project.

them. The same provision was made with respect to the oil and potassium leases on the public lands, and the water power leases. In any program for the regional conservation and utilization of water and land resources, this problem of loss of revenue will undoubtedly be encountered, and necessitate some compromise with the localities and states so affected.

The argument that the proposed Boulder Dam project was entirely for the benefit of the Imperial Valley and the cities of Southern California and that it constituted a "raid on the National Treasury" was frequently offered by the opposition, and originated primarily in the jealously of the other states in the basin. As stated by Governor Dern of Utah:

> "If we wanted to be selfish we could find some good reasons for opposing the Boulder Dam. For one thing, we might fear that the products of the new lands to be reclaimed by this project would glut the Los Angeles market and hurt our farmers. For another thing, we might fear that the extremely cheap power that Los Angeles expects to get from the Boulder Dam will attract new industries there and keep them from locating in Utah, thereby retarding our growth. . . . . for still another thing, we might fear that this great new supply of cheap hydroelectric power will destroy a great potential market for Utah coal. For a final objection, I might cogently urge that Congress will be guilty of sectional discrimination if it takes money from the National Treasury, part of which is contributed by Utah, to give Los Angeles an industrial advantage over Utah cities, since that would amount to using the money of Utah taxpayers to their own hurt."[18]

The representatives of Arizona were much more outspoken in their condemnation of the project as a scheme for purely local aggrandisement. As was stated by one representative from Arizona, "The inhabitants of southern California plan to have one glorious everlasting drunk on the water and power of the Colorado River stolen from Arizona. On the whole, it is the most diabolical promotion that

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18. Hearings on H. R. 5773 before the House Committee on Irrigation and Reclamation, 70th Cong., 1st sess., p. 194.

has ever flitted before my eyes."[19]

This opposition brings in the problem of social policy as to local benefits and the proper role of the national government. That certain localities in southern California would be directly benefited by the project is undeniable; yet indirectly the entire region would benefit from the construction of the dam, the All-American Canal and the aqueduct, and the stimulation of agricultural and industrial development in the Pacific Southwest. Moreover, it must be remembered that the localities receiving the benefits were to pay the full cost of the project through the water and power charges. Furthermore, it can be argued that any improvement in the social or economic well-being of a large group of people in the country is a matter of national concern; and that the prevention of floods in the Colorado River valley is a protection of interstate commerce and the mail service inasmuch as several of the transcontinental roads cross the lower river and the Imperial Valley. In the final analysis, however, the reason for development of the project by the national government was not one of either local or national benefit but one of economic and political expediency. Because of the interstate and international complications, the inability of the states to undertake the development of the river cooperatively, the variety of uses of the water to be coordinated in the project, and the possible conflicts between these different uses, the Federal Government was the only agency capable of dealing with the problem. All uses could be coordinated and the fullest benefits realized only by centralized national control.

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19. Hearings on H. R. 2903 before the House Committee on Irrigation and Reclamation, 69th Cong., 1st sess., p. 60.

The subject of the comprehensive development of the river played an important role in the fight for legislation and was highly colored by special interests. For example, the representatives from Arizona claimed that the construction of a high dam at Boulder Canyon would defeat a systematic development of the river by destroying valuable sites further upstream.

> "The logical and practical way to develop a river is to begin at its source and work toward its mouth. This bill (S. 3331) proposes to reverse this logical and practical order of development."[20]

The power interests agreed that the "greatest benefit to the country will be attained by the development of the whole river under a single, comprehensive, coordinating plan, by eliminating all waste and eliminating all conflict."[21] Their concept of such a plan, however, was to confine governmental activity to the flood control question and allow the private power companies to develop the power sites as the demand arose.

The problem of comprehensive development involves much more than the consideration of the engineering and scientific aspects of maximum storage, the quality of irrigable land or the realization of the maximum potential power. It must be viewed in conjunction with many economic and social factors. The variety of uses of water or the need for control will depend upon the particular conditions of the drainage basin. For example, it may be necessary to sacrifice power development in order to secure an adequate water supply; or fertile lands may be overflowed in order to protect cities and in-

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20. Minority report of Senator Ashurst, Sen. Report 654, Pt. 2, 70th Cong., 1st sess. Senator Ashurst urged the Glen Canyon dam which was advocated by the Arizona High Line Reclamation Association.
21. Hearings on H. R. 2903, op. cit., p. 484.

dustries from floods.[22] The plans for development must be based on the existing economic development of the surrounding area. In the case of the Colorado, the Imperial Valley had been developed so that flood control and storage works were essential to its future growth and prosperity. The future development of the cities on the coast was conditioned by an additional water supply which could only be obtained from the Colorado. Moreover, the only demand for Colorado River power was from these cities. The plan of development, therefore, had to be determined in the light of these factors. As stated by Secretary Hoover:

> "There are theoretical engineering reasons why flood control and storage works should be erected further up the river and why storage works should be erected further down the river, and I have not any doubt that given another century of development on the river all these things will be done. The problem that we have to consider, however, is that which will serve the next generation in the most economical manner, and we must take capital expenditure and power markets into consideration in determining this. I can conceive the development of probably fifteen different dams on the Colorado River, the securing of six or seven million horsepower; but the only place where there is an economic market for power today . . . . is in southern California."[23]

The Boulder Dam site was chosen, therefore, in that it was the closest to the power market, yet would give the necessary flood protection and storage for irrigation and domestic purposes. By limiting the height of the dam to 550 feet, the next most important power site upstream, that at Glen Canyon, is not destroyed. The project is, therefore, in accord with the future economical utilization of

22. The suggestions of the Arizona and power interests for a flood control dam at Topock would have inundated the town of Needles, tracks, bridge and other property of the Santa Fe railroad, the Ft. Mohave Indian School and irrigable farm land. It was stated at the hearings that it would be very difficult to develop this reservoir if the Santa Fe Railroad took an antagonistic attitude. (Hearings on H. R. 2903, op. cit., p. 1536.)

23. Hearings on S. Res. 320 before the Senate Committee on Irrigation and Reclamation, 68th Cong., 2d sess., p. 601.

the water.

The problem of responsibility for and administration of the various aspects of water utilization included in the plan was a fundamental cause for the delay and the bitterness of the fight for legislation for it involved the question of the development of power. Confining attention solely to the problem of division of responsibility (and omitting from consideration the problem of allocation of water and division of costs) there was no objection to a Federal flood control project for the protection of the Imperial Valley. The assumption of responsibility by the Federal Government for the development of the western states by irrigation was also conceded. Furthermore, there was little objection to the proposal that the needs of Los Angeles for water supply be coordinated with the Federal flood control and storage project, assuming that the aqueduct would be constructed and maintained by the city. The controversy as to responsibility was centered primarily on the power aspect of the project and the private power interests put up a determined fight to prevent the development of power by the Federal Government. The arguments of the power interests were based on (1) the advantages of free private enterprise in general, and (2) the disadvantages of the Boulder Dam project in particular. The arguments as to the advantages of free private enterprise attribute the happiness and character of the American people as well as the economic prosperity of the nation solely to the freedom of the business man in the conduct of his affairs, and any move in the direction of Government owned enterprise was viewed as the beginning of the complete downfall of the nation. This argument was presented by Representative Sproul of

Kansas during the House debates as follows:

> "I wish to call attention to a well-known policy of this Government, namely: That the Government shall always refrain from engaging in competitive business; to preserve such policy and attitude toward private business as shall not discourage, but shall encourage it to seek investment in all lines of legitimate business. . . .
>
> Along with the equal liberties, opportunities, franchises, privileges, and immunities which are guaranteed by the Government to its citizens to make them a proud, patriotic, sovereign people in being active in governmental affairs are equal encouragements, immunities and assurances covering business affairs. In fact, Mr. Chairman, the genius of our Government lies in the interest it has shown for the making of a good citizenry -- an independent, self-reliant, resourceful, sagacious, and keen-minded people. Now, shall we be unappreciative of the great document -- the Constitution, and the purposes of our people in the operation of the Government under it in such a way as to virtually destroy its greatest worth; to rue the course which the Nation has pursued toward private industry and enterprise. By our action in putting the Government in business, shall we end a most enviable and exemplary career for our people and Government? Shall we take the first long stride toward communism?"[24]

The utility associations launched a nation-wide campaign to defeat the Swing-Johnson bills which included the widespread distribution of condemnatory literature and of editorials to the newspapers. Chambers of commerce and other commercial and civic organizations were contacted to gain their support in influencing congressional representatives. Debating material and public speakers were freely supplied. Utility representatives were sent to the meetings of the Colorado River Commission to remind the commissioners of the sovereign rights of the States to control the use of water and power sites. The utilities were not unmindful of the possibilities of preventing Federal legislation by arousing state patriotism and impressing the fact upon state legislatures that Federal property could not be

24. Congressional Record, Vol. 69, Part 9, p. 9762.

taxed.[25]

The following exerpt is taken from an editorial distributed by the Joint Committee of National Utility Associations as a sample of the arguments advanced by the power interests that any activity of the Government in the power business is absolutely contrary to American ideals and subversive of American institutions:

> "The Boulder Dam project offers a fine avenue through which to place the Government into business. It is the wedge by which the radicals hope to force the Government to take over all the public utilities.
>
> The attitude of the public should be complete support for any sane plan for flood control, but absolute opposition to any scheme for putting the Government into private business.
>
> That achievement of improved service and decreased cost was not accomplished by Government ownership. It is the result of our American industrial system. That system has been the fruitage of our entire national experience. Our magnificant success has placed us on top of the world. Shall America turn its back upon the past -- upon its experience, upon its training? Shall we carry the economic assets of a hundred millions of people into a gambling den?
>
> The American people do not wish to rock the boat of their prosperity. They do not wish the Government to plunge into the 'give and take' of business enterprise. That is precisely the course mapped out for the Government by the opening wedge of the Boulder Dam bill."

The attempt of the utilities to arouse the antagonism of the States not immediately affected by the development of the Colorado River is indicated in a letter to the Ohio Chamber of Commerce in 1928 from the Joint Committee of Utility Associations, pointing out the interest of Ohio in the Swing-Johnson bill as follows:

1) Because the time has come for the States to reassert their rights and end further centralization of power and activities of the Federal Government;

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26. The extent of utility propoganda against such projects as Boulder Dam, Muscle Shoals and the St. Lawrence are clearly revealed in the Federal Trade Commission investigation, Utility Corporations, Sen. Doc. 92, 70th Cong., 2d sess.

2) Because Ohio is the fourth State in the Union in point of wealth, and furnishes six times the amount of capital toward the financing of this project than would be furnished by all of the area to be directly benefited;

3) Because there is grave danger that, by log rolling, the radical element of Congress, that is eager to seize every excuse to plunge the Government into private business, will be able to put this scheme across;

4) Ohio is not against Federal reclamation projects. It is not against protecting life and property from floods anywhere in the United States. It is not against the Federal irrigation policy. Ohio is against putting over a Government ownership project as a rider to a bill that is put forward on the grounds of humanity or fair play.

This letter was closed with the following statement: "If you agree with our position will you please at once so advise your Representatives in both Houses of Congress? It is imperative that this action be prompt."[26]

At the hearings on the Boulder Dam bills, the power interests expressed complete indifference as to any legislation passed by the United States Congress, although they did consider the proposed legislation to be a municipal ownership bill and a socialistic scheme.[27] The representatives of the Southern California Edison Company did, however, indicate some fundamental errors of the Swing-Johnson bill which would be detrimental to the public interest. The Edison Company had filed applications with the Federal Power Commission for

26. Ibid., Exhibit No. 207.
27. See the hearings on H. R. 2903, op. cit., p. 466.

all the important sites on the lower Colorado River, and expressed complete willingness to operate their dams and reservoirs in the interests of flood control and irrigation. Although applications for the sites had been filed, however, the Company indicated at the hearings that there would not be a sufficient demand for the power to warrent construction of the high dam at Boulder, that it would not be a self-supporting proposition.

> "Our mature judgment, without any desire on our part to influence the United States Government from building a dam on the Colorado River for flood control, and for the development of power, if it wants to, is that as a business proposition the Government should not undertake so large a development and bring it in and expect it to pay."[28]

The position of the power company is that of a protector of the public interest, to prevent the Government from building a project that could not be financially self-liquidating. As stated by Mr. Ballard, vice-president of the company, "the Company would object to the representatives of the people of the United States saddling these people in unwise development."[29] There was no objection, however, to public expenditure for flood protection and irrigation projects, or to the proposed $150,000,000 aqueduct for a domestic water supply to Log Angeles. If the Government persisted in building the high dam at Boulder, however, the Edison Company urged that it be given the right to market all the power, asserting that it could produce and distribute power from the Colorado River at a cost to consumers considerably less than any other agency. This assertion was based on the diversified character of its load and the possibility of interconnection of this power with other hydro and steam plants in its system. The company further pointed out that there was no satisfactory law by

28. Ibid., p. 507.
29. Ibid., p. 508.

which the municipalities of southern California could club together and build a transmission line to the Boulder Canyon Dam.[30]

The Federal Power Commission was sympathetic with the private power interests in the controversy, which put Secretary Weeks in the somewhat awkward position as sponsor of the bill as executive head of the Interior Department, and an opponent as a member of the Power Commission. The Commission disapproved of the Swing-Johnson bill because of the proposed power policy and the provisions for administration of the project.[31]

30. "Furthermore, no such scheme could be feasibly worked out. The electric business is of such a character as to require a strong central controlling authority, a thing which is not consistent with the independent nature of cities. The city of Los Angeles is not a satisfactory administrative unit, because it is not set up for the business of selling power at wholesale to other municipalities. . . . . The distribution of electric power from Colorado River power sites is really an interstate matter which should be entrusted to such agency only as has freedom of interstate action, either by the United States Government itself, or some agency created by it, or under regulation by it. The best agency of that kind is a public service corporation." (Ibid., p. 479.)
The power companies felt there was little danger in the possibility of the Federal Government undertaking the distribution end of the project.

31. In a letter to the House Irrigation Committee, dated March 24, 1924, the Commission stated as follows:
"If the United States is to embark upon a general policy of public development of electrical energy at Federal expense, it should do so only after full consideration of what that step means. . . . . A policy of Federal development would require continuous expenditures of not less than one-half billion dollars per annum, for it could not be expected, in the face of such a policy supported by Government funds and tax exempt properties, that private industry could afford to put any additional investment into the central station business. Under such circumstances we must assume that any such a policy or program of Federal activities is impracticable or undesirable."
As to administration, the Commission stated that the plan adopted in the water power act had proven eminently successful. "We believe any change in such method of administration is undesirable, and therefore, whether the Boulder Dam or some other be built and whether at public or private expense, we believe the disposition of any power developed should be

The proponents for development of power on the Colorado by the Federal Government as part of the combined project were motivated by a variety of factors. In the first place, Los Angeles wanted the power to supplement the needs of her municipal system and allow complete severance of connections with the private power company. A second, more general, reason for the interest of the southern California cities in the power development was the hope that cheap power would stimulate industrial development. Thirdly, the fact that the power revenues would make the flood control-irrigation storage-domestic water supply project self-supporting was a strong point in its favor, and was probably the most effective argument offered for power development.[32] A fourth motivating factor was the idea that the generation of power at a Government project would establish a standard by which the rates of the private power companies

(Cont'd) handled by the Federal Power Commission under the general terms of the Federal water power act and not as proposed in this bill." (Ibid., p. 1001.)

32. The financial setup of the project as submitted by the Reclamation Bureau in 1924 in the Weymouth report was as follows:

Capital investment		Annual revenues	
Reservoir	$41,500,000	Sale of 3,600,000	
Power development	31,500,000	k.w. at 3 mills	$10,800,000
All-American canal	31,000,000	Sale of water for	
Interest at 4%	21,000,000	irrigation and domestic uses	1,500,000
Total	$125,000,000		$12,300,000

Annual charges for operation and maintenance, storage and power,	$ 700,000
Annual charges for operation and maintenance, of the irrigation canal,	500,000
Interest on $125,000,000 at 4%	5,000,000
Total	$ 6,200,000

Estimated annual surplus $6,100,000, thought to be sufficient to repay entire cost of the project in twenty-five years.
(Congressional Record, Vol. 68, Part 4, p. 4415.)

could be measured. By selling this power to municipalities, an automatic check would be provided for regulating the power industry. As has been stated by one writer:

> "The increasingly apparent weaknesses of our present system of utility regulation reveal the need for some additional leverage upon the private power companies, unless complete ownership is to be the unavoidable alternative. No more hopeful method can be found than the development under public auspices of such strategically located water powers as those of Muscle Shoals, the St. Lawrence, the Columbia, and the Colorado, with preferential rights and full legal authority for those communities which are willing to undertake the function if distribution. . . . . We shall have established public standards which will go far in the automatic regulation of the power industry."[33]

Lastly, the proposal for the combined project received support from the small but steadily increasing group in Congress which advocated comprehensive planning of river systems for conservation and more complete utilization of these resources. The Colorado River offered an excellent opportunity for coordination of many uses of water in a single combined project as a first step in the development of the river.

Assuming that the combined Boulder Canyon project were adopted, however, there was still a conflict as to the proper method for the development of the power. The Government could build the dam and control the release of water for its various purposes, and lease the right to use water for power generation to private and public agencies. Or it might build the power plant and lease the different units to these agencies. As a third alternative, the Government could build and operate the power plant, selling the power at the switchboard. No consideration was given to the possibility of distribution of the power by the Government. It was assumed that transmission lines

33. Bird, F. L., "Who Will Benefit by Boulder Dam", New Republic, Vol. 63 (July, 30, 1930), p. 311.

would be built jointly by the agencies contracting for the power and connecting with their private distribution systems. Each possible method of handling this power had its adherents in Congress.

The problem of the proper distribution of costs, although one of the most important aspects of multiple purpose projects, was given little consideration in the fight for the Boulder Canyon project. Objections were advanced on the ground that the revenue from power should not be used to subsidize flood control and irrigation projects, but the purpose of such objections was to defeat the bill or, at least, to eliminate the power aspects of the project, rather than to suggest a different allocation of costs. The argument of the Federal Power Commission is illustrative of these objections:

> "The United States has spent many millions of dollars in internal improvements without reimbursements, particularly on river and harbor improvement and on public highways. These expenditures have been for the primary purpose of facilitating interstate commerce, and on the theory that such a policy was a common public benefit and properly chargeable against the taxpayers of the entire Nation. Whether the benefits received from such a policy are in fact nation-wide, the policy is far less questionable than that of charging the costs of an improvement admittedly benefiting a limited area not against the area benefited and not against the Nation as a whole but against industries and individuals for the most part wholly unrelated to the area benefited. We are most doubtful of the propriety or equity of so charging the cost of flood control and irrigation storage, whether the construction be financed by private or public capital."[34]

The earlier bills had provided that the entire cost of the dam, reservoir, the canal and the power facilities be considered as one item, to be amortized by power and water charges, with primary emphasis on power. If the water payments did not materialize as anticipated, the power charges would cover the cost of all these facilities. Because of the accusations of unfair subsidies, the

34. Hearings on S. 2903, op. cit., p. 1001.

later bills considered the canal as a separate item, segregating the cost thereof, and requiring repayment from the lands directly benefited. No attempt was made, however, to segregate any other aspects of the project. The separation of the canal from other aspects of the project did not alter the assumption that the Government would charge all that the market would bear for the power. The value of the power from Boulder was computed by ascertaining the costs of alternative sources of power. On this basis, the project was not only self-liquidating but would yield a sizable surplus.

The problem of cost allocation is closely related to that of public power policy, the only aspect of which received consideration during the Boulder Dam controversy was the "yardstick theory". As has been mentioned, the possibility of establishing a government standard for rate regulation was advanced as an argument in favor of the project. Insofar as the rates for this power were to be determined by the costs of securing additional power by alternative methods, the construction of the project or generation of power at the dam by the Government offered no standard as a basis for rate regulation. Regardless of the basis for power rates, however, the Boulder Dam project could not serve as a "yardstick", as a measurement of costs of producing power, for the costs of the various aspects of water utilization realized from the project are jointly incurred. There is no comparison between the generation of hydroelectric power in conjunction with flood control and storage for irrigation and domestic water supply, and the production of power for profit as a single product by a private business enterprise.

There is another aspect of public power policy which arises in connection with the problem of cost allocation and the determination

of rates for power from a Government project; that is, the social aspects of the use of electricity. The importance of power to the comfort and happiness of the people cannot be overemphasized. For lighting purposes and for labor-saving devices in the home and on the farm, it is a service for which there is no substitute. Yet the rates for such power have been so high under private operation of the industry that its use has been limited. A government project such as Boulder Dam offers an exceptional opportunity to promote the widespread use of electricity. As long as public attention is directed to the revenue producing possibilities of power, however, not only to finance the entire project but to yield a substantial surplus, as happened in the case of the Boulder project, these more fundamental aspects of social policy are neglected. Moreover, there was apparently a general feeling that if the project were constructed by the Government, the power which would be produced would be sold to the city of Los Angeles and the surrounding municipalities. The question of the resale price of power did not, therefore, receive any attention.

Both Arizona and Nevada objected to the use of land and power sites within their boundaries to supply southern California with cheap power, and any such proposal would probably have brought objections from all the other basin states. In a list of recommendations to the Senate Committee in 1928, the Nevada Colorado River Commission urged that "the power not be sold as low as the repayments to the Government will permit, but should be sold at a competitive figure comparable with the cost of power available elsewhere for this market."[35]

35. Colorado River Development, Sen. Doc. 186, 70th Cong., 2d sess., p. 18.

As the project grew out of the needs of the Imperial Valley for an American controlled canal and storage facilities, and contemplated the increase of irrigable acreage, it was originally a reclamation project, which was sponsored by the Bureau of Reclamation and the Department of the Interior. All of the proposed legislation provided that the Bureau would be the administrative agency. The Secretary of the Interior was also authorized in the earlier bills to construct any other canals and necessary irrigation works for lands which could be economically served from the Boulder Canyon reservoir. The total irrigable acreage below Boulder was estimated at 2,020,000 acres; of which 800,000 is in Mexico. Of this total, 1,023,000 acres could be irrigated by gravity and 197,000 acres by pumping. At the time of the Fall-Davis report (1922), 167,000 acres of the total in the United States were public lands. By 1925 much of this land had already been taken up, contemplating a great increase in value after construction of the dam.[36] The general opposition to any immediate extension of the Federal reclamation policy led to the withdrawal of this provision from the final act.

When the Boulder Canyon project was first considered, Federal expenditures for flood control were limited to the lower Mississippi Valley and substantial contributions were made by the local districts. The project was being considered by the same session of Congress, however, which passed the Mississippi Flood Control Act, whereby complete responsibility was assumed by the Government. There was, consequently, some question as to the proper policy to pursue with respect to Colorado River floods. The problem was one of distributing the cost among the benefited localities, the power

36. Problems of the Imperial Valley, Sen. Doc. 142, 67 Cong., 2d sess., p. 8.

consumers and the Federal Government. An amendment to the bill was proposed by Senator Phipps (of Colorado) in 1928 providing for the allocation of twenty-five million dollars of the total cost of the project to flood control which would not be reimburseable. This proposal was in line with the policy of the Government which had just been adopted for the Mississippi. Inasmuch as the proponents of the bill had maintained that it would be self-supporting, the amendment was not accepted. In the final act the full cost of flood control was to be repaid out of power and water revenues, with primary emphasis on power, and the obligation of the Imperial Valley was limited to the canal. There is a considerable question as to the desirability of completely relieving the benefited districts and the Federal Government from the cost of flood control, particularly in view of the fact that the Federal irrigation project at Yuma is also directed benefited by flood protection.

The Boulder Canyon Project Act

After a bitter six-year fight over these problems, and two successful filibusters by the Arizona Senators, a compromise was finally effected and the Boulder Canyon Project Act was approved December 31, 1928.[37] The essential provisions of the act are as follows:

1) The purpose of the act, as stated, is "to control floods, improve navigation, and regulate the flow of the Colorado River, to provide for storage and use exclusively within the United States, and to generate electrical energy as a means of making the project a financially solvent undertaking." (Sec. 1.)

2) The Secretary of the Interior was authorized to build a

37. 45 Stat. 1057.

high dam at Black or Boulder Canyon (presumably as indicated in the Weymouth Report), and an all-American canal to divert water from the Colorado River to the Imperial and Coachella Valleys, with facilities for the full utilization of the dam, reservoir and canal for generation of power. An aggregate expenditure of $165,000,000 was authorized for the project.

3) The Imperial and Coachella irrigation districts shall contract with the Secretary for repayment of the canal, the diversion dam, and other appurtenant irrigation structures during a forty year period in the manner provided in the Federal reclamation laws. No charge shall be made to these districts for water for irrigation or potable purposes. The cost of the Boulder Dam and reservoir shall be repaid at four per cent interest during a fifty year period from power and water charges, contracts for which were required prior to construction. The Secretary of the Interior was given the choice of leasing the use of water for power, building a power plant and leasing the units thereof, or operating the plant and selling the power at the switchboard. The Federal Government was not to distribute this power. Provisions were made, however, for the joint use of transmission lines.[38]

4) These power contracts were to be made with a view to receiving "reasonable returns". The rates for power were to be determined by competitive conditions at distributing points or competitive centers, and subject to readjustment at the end of fifteen years from

38. "Any agency contracting for less than 25,000 firm horsepower shall be given the privilege of using the transmission lines to be constructed by the large contractors, upon payment of a reasonable share of the cost of construction, operation and maintenance of such facilities." (Sec. 5 D.)

the date of the original contract and every ten years thereafter.[39] In granting power contracts, first preference was to be given to the states in the lower basin for use within the respective states, with a six months option to exercise such rights. In case of conflicting applications for power, they were to be decided by the Secretary in conformity with the policy expressed in the Federal Water Power Act as to conflicting applications for permits and licenses, with the specific provision that no application by a State or municipality should be denied on the ground that a bond issue had not been authorized or marketed until reasonable time had been given to the applicant.[40]

5) Twenty-Five million dollars of the total cost of the project was allocated to flood control to be repaid out of 62½% of the revenues in excess of the amount necessary to meet the periodical payments during the period of amortization. The other 37½% of excess revenues are to be divided equally between Arizona and Nevada, as compensation for the loss of potential revenue by these states.

6) Upon repayment of all money advanced by the United States with interest, all revenues derived from water and power charges shall be kept in a separate fund to be expended within the Colorado River Basin.

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39. As to the establishment of power rates and the policy to be adopted for readjustments, the intention of Congress is indicated in the following report from the Senate Irrigation and Reclamation Committee:
"The theory of this amendment (to readjust rates as prevailing in competitive centers) is to keep the rates as high as economic conditions will justify, in order first, that the Government will receive its money at as early date as possible; secondly, that there will be excess profits for the States of Arizona and Nevada; and, also, that the contractee will not unnecessarily suffer in the event economic conditions will require a lowering of rates." (Sen. Report 592, 70th Cong., 1st sess.)

40. Insofar as applicable, all other requirements of the water

7) The act was to take effect immediately upon the approval of the seven states to the allocation of water as designated in the Colorado River compact; or, failing such ratification within a six months' period, upon the ratification of the six states. Furthermore, the state of California was required, by act of its legislature, to agree that its aggregate annual consumption of Colorado River water (including all existing rights and future rights created by contracts under the Act) shall not exceed 4,400,000 acre-feet of the water apportioned to the lower basin states, plus not more than one-half of the surplus water. Nevada was alloted the 300,000 acre-feet which had been estimated as sufficient for her needs; and Arizona received the remainder, plus all the water of the Gila River.

As a further concession to Arizona, the Secretary was directed to make studies of the Parker-Gila Valley reclamation project, to determine the most feasible method of irrigation and to estimate the cost thereof.[41] An appropriation of $250,000 was authorized to make investigations of irrigation and power projects in the Basin, to formulate a "comprehensive scheme of control and the improvement and utilization of the water of the Colorado River and its tributaries."

Meetings were held after the passage of the act to secure the ratification of Arizona to the compact. The principal objection of the State at that time, however, was to the revenue provisions rather than the allocation of water. Arizona wanted an assured minimum revenue, based on horsepower generation, instead of the indefinite return from excess revenues. With the failure of Arizona to accept

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(Cont'd) power act, as to adequate maintenance, accounting, regulation of rates and services, recapture provisions, and transfer of contracts were applicable. (Sec. 6.)

41. The Parker-Gila project has recently been adopted as a Federal irrigation project and construction has been started with funds granted by the Public Works Administration.

the compact, the six state agreement took effect in June of 1929.

When the Secretary asked for bids for power contracts, he received requests for over twice the amount of power to be generated. The pessimistic warning of the power interests as to a lack of demand for Boulder Dam power on terms which would liquidate the investment proved totally unwarranted. Not only did the California municipalities request all of the power, but so did the Southern California Edison Company interests. Although Arizona and Nevada had no immediate use for their share of the power, they wanted to exercise their preferential rights and resell the power to private companies in other states. At the last minute, Utah also came into the picture, placing a claim for 50,000 horsepower of firm power.

Temporary allocations were made by the Secretary whereby the Metropolitan Water District of Southern California, which includes Los Angeles and twelve surrounding municipalities, was granted thirty-six per cent of the firm power and all of the secondary power; eighteen per cent each to Arizona and Nevada, and the remaining fourteen per cent to be divided equally between Los Angeles and the Edison Company. It was determined that Arizona and Nevada could not take their allocations of power for resale. This thirty-six per cent was, accordingly, granted to the California municipalities and the private company in equal shares. In addition, the municipalities and company were to receive all the secondary power until such time as it might be needed by the Water District. These allocations immediately aroused antagonism and were generally considered as a direct violation of the preference clause in the Water Power Act to municipalities. Secretary Wilbur accordingly requested Solicitor Finney of the Interior Department for a legal interpretation of the

preference clause and the extent to which it would be applicable in view of the "greater contractual responsibility and better financial security of the private companies." The Solicitor decided that the "public interest" was the controlling factor, and that such interest would be served best by a financially responsible agent with a wide market for the power which would assure the solvency of the undertaking. The Solicitor also stated that the regional use of this power would be more beneficial to the public than local use. If the municipality were to sell power wholesale outside the city limits, however, the Solicitor decided that the preference requirement was not applicable. These two statements, taken together, would completely nullify the preference clause. Furthermore, the opinion stated that the provisions of the act as to municipal bond issues was not designed to tie the hands of the Secretary pending the authorization and marketing of bonds. The preference clause would not be violated so long as the contract with the private companies reserved the right of the preference claimant to contract for power.[42] Considering the long-standing enmity between the city and the power company, it is difficult to believe that an amicable arrangement of this nature would be satisfactory to the city.

The opposition in Congress to the Solicitor's opinion and the Secretary's allocations, which was led by Senator Norris, insisted that they had a better idea as to the intended meaning of the "public interest" and the preference clause than did a legal advisor in the executive department.[43] As stated by Representative Swing in a brief

42. Anderson, Paul Y., "Boulder Dam Dynamite", Nation, Vol. 130, (February 12, 1930), p. 173.
43. Solicitor Finney was not highly regarded at that time anyway because of his legal opinions in regard to the Teapot Dome oil leases.

submitted to the Secretary of the Interior:

> "The words 'public interest' used in the Boulder Dam Act were intended to mean exactly the opposite of private interest . . . .
>
> Congress meant and intended and declared that whenever possible the public, that is the people, should get the benefits of the development of the great public resources through their own public agencies, direct and at cost, without . . . . paying profits to a private power corporation."[44]

So widespread was the dissatisfaction that a compromise reallotment was made, giving Arizona and Nevada each eighteen per cent; thirty-six per cent to the Water District; thirteen per cent to Los Angeles; six per cent to the other Californian municipalities; and nine per cent to the California Edison Company. All secondary power was alloted to the Water District with a privilege to the City and the Company to use equally until it was needed by the District. The shares of Arizona and Nevada were alloted to the City and the Power Company. The States may demand their allocations, however, at any time for fifty years. The municipalities, therefore, were to receive a total of thirty-seven per cent of the power, plus half of the secondary power; and the private company twenty-seven per cent, plus half of the secondary power. Since these allocations were made the Colorado River Commission of Nevada has contracted for the purchase of four million kilowatt hours per annum of the amount of power allocated to the State of Nevada. The Reclamation Bureau has no record, however, as to how this power will be divided. These contracts have been made for a fifty-year period and the power allocations are not alterable.

The rates for the power were set at 1.63 mills per kilowatt-hour

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44. Finney, Ruth, "Secretary Wilbur and Boulder Dam", Nation, Vol. 130 (February 19, 1930), p. 215.

for firm energy and one-half mill for secondary power. The final cost estimates on the project were greater than the former calculations of the Reclamation Bureau. The Act authorized appropriations not to exceed $165,000,000, which amount is divided as follows: Dam and reservoir, $70,600,000; power development, $38,200,000; All-American Canal, $38,500,000; interest during construction, $17,700,000.[45] At these figures, the surplus revenue will not be as great as originally anticipated by the Government. The 1924 figures were based on a sale price of the power of three mills per kilowatt-hour, and the cost of the project at $125,000,000. No definite determination can be made of the surplus revenue, however, inasmuch as the power rates are subject to revision every ten years. At the present rates, however, the total gross power revenue is estimated at $361,000,000, which leaves a surplus -- after allowing for operation and maintenance, interest, depreciation, and payments for retirement of the investment -- of $166,000,000. This will give an average annual payment of $620,000 each to Nevada and Arizona. Of the Government's share of the surplus ($104,000,000), $37,500,000 will be used for payments for retirement of the $25,000,000 allocated to flood control with interest at four per cent. The remaining $66,500,000 will go into a fund to be expended within the Colorado River Basin as prescribed by Congress.

At the time the temporary allocations were made, the Secretary of the Interior decided to leave the water rights and have the lessees build and operate the power plant. Such an arrangement immediately encountered opposition when it became apparent that the

45. While Boulder Dam has been completed, other features of the project are still under construction. There are, therefore, no final cost figures available.

Secretary intended to allot the private company a share of the power. There was but one logical site for a powerhouse, and to leave all arrangements of construction and operation of the plant or plants to these two interests who had been bitter enemies would have resulted in a very awkward situation. The Secretary finally decided, therefore, that the plant should be built by the Government. The machinery and equipment for the generation of power, costing $17,700,000, was installed and is owned by the Government. The contractors are to pay, in ten equal annual installments, an amount sufficient to amortize this total cost. The immediate installed capacity at the plant is 515,000 horsepower. The ultimate capacity is 1,835,000 horsepower. The power plant will be maintained and operated by the City of Los Angeles and the Southern California Company under the general supervision of a director appointed by the Secretary of the Interior. The Bureau of Reclamation will regulate the flow of water through the dam. The City of Los Angeles will generate power for the States, municipalities and the Metropolitan Water District of Southern California. The Southern California Edison Company will generate power for company purchasers. The contractors for power must provide transmission facilities at their own expense. The Southern Sierras Company has built a line from the dam to Riverside, California. The Metropolitan Water District and the City of Los Angeles have lines under construction. A Nevada power district plans the construction of a transmission line from Boulder Dam to Pioche, Nevada. The construction of power lines has been financed by government loans to the power contractors.

Arizona brought an injunction to refrain the Secretary of the Interior from building the dam, on the ground that the appropriation

of water and the use of the natural resources of a State without its consent constituted an unconstitutional invasion of the state's sovereign rights. The bill was dismissed by the Supreme Court. The decision stated that Arizona was not injured by the construction of the dam or by the six-state compact.[46] No attempt has been made by Arizona to reach any agreement with the lower basin states.[47] An intrastate conflict as to allocation of water in California delayed the initiation of the canal and the water aqueduct. An agreement was finally reached in 1931 and contracts for water were concluded with the interested agencies. The Metropolitan Water District is to pay the United States twenty-five cents per acre-foot for the actual amount used, or an average annual payment of about $250,000. No charge will be made to the Imperial and Coachella irrigation districts for water, either for irrigation or potable purposes. A bond issue of $220,000,000 was authorized by the Water District at a special election held on September 29, 1931. The Reconstruction Finance Corporation has purchased $90,000,000 of these district bonds which will finance construction work through 1935. The Boulder Dam

46. Arizona v. California, 283 U. S. 423 (1931). The opinion in this case, written by Justice Brandeis, stated that the Colorado River was a navigable stream at Black Canyon where the dam was to be built (in spite of the fact that Congress had approved the interstate compact which declared that the Colorado had ceased to be navigable); that the dam would improve navigation; that the United States need not conform to the police regulations of any state; and that inasmuch as Arizona had not ratified the compact it was not injuriously affected thereby.

47. In 1934 Secretary Ickes again attempted to effect an agreement between the lower basin states as to the allocation of water. Nevada was now demanding one million acre-feet, and California had already appropriated or contracted for a total of 5,362,000 acre-feet, which is 962,000 acre-feet in excess of the amount specified for California in the Boulder Canyon Act and must come out of the surplus water for the lower basin states of which California is entitled to one-half. A report of the Arizona Colorado River Commission of May 3, 1935, definitely stated that any agreement between Arizona and

was completed in 1935, the Imperial Dam and the All-American Canal, and the Parker diversion dam and the water aqueduct are nearing completion.[48]

The completed project will meet all requirements for flood control, river regulation, silt control, storage for irrigation needs and domestic water supply, and includes plans for the ultimate production of the maximum available power consistent with the other uses of water. In addition to performing these original services for which it was constructed, the Boulder Dam reservoir (which is known asLake Mead) is unquestionably destined to become one of the most important recreational centers of the Southwest, and the Bureau has made plans to develop it in conjunction with the Forest Service. The reservoir will also serve as a wildlife refuge. From an economic and engineering viewpoint, therefore, the project is in accord with a comprehensive plan of development of the Colorado River basin. The project offers an excellent illustration of the advantages which may be realized when all uses of water are taken into consideration and provision is made for them in a coordinated plan.

From the viewpoint of social policy, however, the project is open to many objections as to the allocation of costs, the arrangement for the sale of power, the administrative set-up, and the future development of the region. The act definitely contemplated in the provisions for the sale of power and use of the surplus revenues that power contracts shall be made with a view to receiving the

(Cont'd) California was impossible and that Arizona would seek legal action to limit the appropriation of California and assure Arizona an "equitable apportionment of the waters."

48. Although Arizona had not been able to prevent the construction of Boulder Dam, it attempted to stop proceedings on the Parker Dam and declared martial law on November 10, 1934. The Supreme Court issued a temporary injunction to prevent interference from Arizona but refused a permanent injunction on the ground

greatest possible revenue. Power consumers will, therefore, pay for many aspects of water utilization as provided by the project, such as silt control, the prevention of floods, and the supply of water for irrigation and domestic use to the Imperial and Coachella irrigation districts. In addition, the surplus power revenues will be used to subsidize further developments in the Valley. The greater part of the total power revenues will come from the small domestic and commercial consumers, who have no alternative source of power. Such a policy for repayment of the costs of a multiple-purpose project is unjust and socially indefensible. It is based on the concept of private finance that an undertaking must be self-liquidating, and naturally receives the staunch support of the private power companies, the beneficiaries of other aspects of the combined project, the States which are to share in the excess revenues, and the business and political interests who fear the effect of cheap power in stimulating the agricultural and industrial development of other parts of the country. By accepting this policy the Government has conceded to the interests of certain financial groups and political bodies. The ideal of social welfare and justice demands that power revenues pay but a part of the costs, and that the power consumers be allowed to share in the economies of production which result from coordinated river regulation under Government operation. The provision for payments to the States of Arizona and Nevada from the excess power revenues is poor public policy. These states will unquestionably oppose any attempt of the Government to lower rates.

(Cont'd) that the dam had not been specifically authorized by Congress or the President. (55 Sup. Ct. Reporter 666.) A bill was accordingly passed immediately by Congress authorizing construction of the dam.

The arrangement for the distribution of the power from the project is equally objectionable. In the completed plan, power will be developed at various places. In addition to the power development at Boulder Dam, there will also be plants at the Parker Dam, on the water aqueduct and the All-American Canal. The Boulder Canyon Act makes no provision, however, for the unified development and operation of these plants, and gives the Federal Government no control over the retail rates at which the power is to be sold. The plants on the All-American Canal will be installed, operated, and owned by the irrigation districts served by the canal. There are no provisions in the act to prevent the districts from charging the monopolistic rates for power and using power revenues for repayment of the cost of the canal.

The power plants on the water aqueduct will be under the jurisdiction of the Metropolitan Water District, and the Federal Government will have no authority over the use or rates of this power. The power plant at the Parker Dam will be operated by the Water District under the general supervision of the Department of the Interior. Fifty per cent of this power has been allocated to the United States and fifty per cent to the Water District. There are no provisions in the act for reallocations. There will be no opportunity, however, to withdraw power from the private utilities to meet increasing demands of the preference group. It can be anticipated, therefore, that many conflicts will arise in the future because of these original power allocations. The failure to give the Federal Government any control over the resale price of this power was also very poor policy, and eliminates any possibility of encouraging the widespread use of electricity or reducing rates to the small consumer.

Inasmuch as the allocations were made on a percentage basis of developed power, they will also cover additional installations at the dam. It is unfortunate that these contracts were made for a fifty-year period for the courts would probably uphold the invbl-ability of contract and prevent any change in policy by the Govern-ment as to the distribution of power from the project.

A government agency such as the Reclamation Bureau is not the proper agency to carry out an effective social policy for the opera-tion of comprehensive water development projects involving the pro-duction and distribution of power. For this purpose, an independent agency, removed from political influences, with a continuing per-sonnel, and with the powers and flexibility of a private corporation are necessary. Neither is the Bureau the proper agency to develop and make effective a plan for the unified development of the drainage basin. The Colorado River Basin is a good example of a more or less unified region which has certain peculiar economic problems. In order to realize the greatest benefit from the use and development of the river, a plan is necessary for the entire drainage basin. As stated by the National Resources Board, however, the planning pro-blem in this region has many ramifications.

> "It involves not only regional, but national, inter-national, State and local interests. It is concerned with reclamation and agricultural policies, development of industries and natural resources, financing, and carrying out of public works, coordination of Federal activities. It is affected by population trends, shifting markets, national and local governmental policies and public opinion. In order to provide for the most advantageous development of the region these various factors cannot be considered properly in in-dependence of each other; their interrelationships must be discovered and taken into account in any comprehensive planning program."[49]

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49. Regional Factors in Planning and Development, National Resources Board, December, 1935, p. 57.

The basin presents an outstanding opportunity for the application of conservation measures in water use and wise land utilization policies. Because of the climate, the area has great social and economic importance. Due to the scarcity of water, the future development of the region will depend on storage and careful utilization of the available water supply. A comprehensive water program will be of little value, however, unless it is accompanied by a program for land utilization and silt control. The recent report of the National Resources Board on public works planning suggests an exhaustive study of the silt problem in the Colorado River basin. Such a study would be of immediate value to that particular area and helpful in dealing with silt control in other drainage areas. The comprehensive plan of development for the Colorado River includes the construction of numerous systems of reservoirs and conduits on both the upper and lower rivers, primarily for irrigation and domestic use, although a large amount of power can be developed whenever there is sufficient demand.

Inasmuch as water is scarce and highly essential to the future economic development of the region, an agreement between the States as to the future uses and appropriation of water is highly desirable. The allotment of water should be based on complete studies of immediate and future availability of water (which is closely connected with the silt problem), the various uses to which the water can be put, and the means of conserving water now used.[50] Projects are

50. As stated by the Board, the allotment of waters cannot be made without full knowledge "of the water consumed in irrigation, of evaporation from reservoirs, of the water that can be economically exported from the basin, and of the contribution and consumptive uses by each State under past, present and final conditions of development. Data essential for the solution of the many problems involved must come from studies and measurements of erosion, the quality of water, stream flow,

now under consideration for diversions of Colorado River water to other basins where additional water is necessary to meet present needs. One such project contemplates the diversion of water from the Gunnison and Frying Pan Rivers, eastern tributaries of the Colorado, to the Arkansas River basin to meet present irrigation needs. A study of this project is now in progress. Other contemplated interbasin diversions into the Great Basin are under consideration to supplement the present meagre surface and underground supplies. Available water in the Great Basin is not sufficient to serve current needs, not to mention prospective uses. The future of this area will depend on the conservation of available water and interbasin diversions for a domestic supply, manufacturing needs and irrigation.

Any hope of arriving at an amicable allocation of water by the cooperative agreement of the States is very slight, however, and illustrates one of the greatest difficulties in achieving a uniform plan for the comprehensive development of an entire river system. The attitude of the States during the Boulder Dam controversy precludes any hope of the sucess of the interstate compact method.[51] A program of conservation and proper utilization of water and land resources, to be really effective, will probably necessitate complete Federal jurisdiction over the use of land and the appropriation of water in the drainage basin under a Federal corporation charged with adequate powers to make this program of land and water use effective.

(Cont'd) underground waters, the consumptive use of water, the effect of forests on water supply and from surveys for reservoirs, irrigation projects, power sites, and transmountain diversions." (Public Works Planning, National Resources Board, December, 1936, p. 115.)

51. Failure of the interstate compact method is discussed in the report of the National Resources Board on Regional Factors, op. cit., pp. 53-70.

Such a suggestion would undoubtedly be denounced as unconstitutional, a radical violation of States' rights, and confiscation of private property. Consequently, it can be expected that future developments in the Colorado River Basin and the adjoining country will meet opposition from political and economic groups and will probably be involved in complicated and protracted litigation.

Summary.

The Boulder Dam project presents a good example of the need for coordinating all aspects of water utilization in a comprehensive plan of development. The Boulder Dam and reservoir provide river regulation, flood control, storage for irrigation and domestic water supply, silt control, and the generation of the maximum amount of power compatible with these uses of water. The Imperial Dam and the All-American Canal will meet the water requirements of the Imperial and Coachella Valleys for irrigation and domestic use and also allow power development. The Parker Dam and the water aqueduct will supply Los Angeles and the surrounding municipalities with additional water supply, and incidentally some power will be generated. A great variety of private and political interests were involved in the fight for the adoption of the project by the Federal Government. Flood and silt control was imperative to prevent the eventual innundation of the Imperial Valley. Storage was necessary to meet the needs of the Imperial and Coachella Valleys for irrigation and allow the development of additional lands. The Imperial Irrigation District urged the construction of the All-American Canal to avoid the many difficulties which had been experienced with the Mexican canal. Los Angeles and the surrounding municipalities were facing a domestic water shortage, and looked to the Colorado to supplement the present

supply. To secure water from the Colorado, however, required a large amount of power for pumping purposes. These cities also wanted additional power to serve the needs of their publicly owned distribution system. On the other hand, the project was bitterly opposed by the private power interests, the American interests in Mexican lands, and the other states in the Colorado River basin.

The resulting legislation was a compromise with these various interests. The project meets the technological requirement of coordination of the various uses of water, but is subject to serious criticism as to the allocation of costs of the project; the policy adopted with respect to the use and distribution of power; the allocation of power under fifty-year contracts; the policy adopted with respect to payments "in lieu of taxes"; and the arrangements for administration of the project. The scarcity of water and the misuse of land in the Pacific Southwest, the opportunities for agricultural and industrial expansion, and the great power potentialities of the Colorado River, require a complete program of conservation and proper utilization of water and land resources in the region, under the jurisdiction of a Federal corporation with adequate powers to make such a program effective.

CHAPTER VII.

DEVELOPMENT OF THE TENNESSEE RIVER

The Tennessee River, which is formed by the junction of the Holston and French Broad Rivers in eastern Tennessee, flows through the states of Tennessee, Alabama and Kentucky to the Ohio River at Paducah. The drainage basin has an area of forty thousand square miles and a population of approximately two million. The development of the drainage basin would indirectly affect the economic and social welfare of some six million people. The river is a navigable waterway and its entire length has been under improvement by the Federal Government for many years under the piecemeal policy of improving navigation. Floods occur frequently on the main stream and on the lower part of most of the tributaries. The average damage by floods is estimated at $1,780,000 annually.[1] There is sufficient rainfall in the Valley for agricultural purposes so that irrigation is not an important aspect of comprehensive development of the river.

As a combined project with navigation and flood control, there are great possibilities of power development. There is a wide variation of flow at different seasons of the year, however, which necessitates large storage reservoirs for river regulation, either for purposes of water transportation or power generation. The flow of the river at some seasons of the year is sufficient to produce more than a million horsepower, while at its minimum flow the horsepower is less than 100,000. With regulated flow and full utilization of the power potentialities, there is three million horsepower annually available on the river system.

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1. Tennessee River and Tributaries, H. Doc. 328, 71st Cong., 2d sess.

A thorough survey of the river and its tributaries was completed by the Army Engineers in 1930. They estimated that the complete development of the river would cost approximately $1,200,000,000. This complete system included a series of high dams for the combined purposes of river regulation, navigation, flood control and power. As presented by the district engineer, the completed system would include 149 hydroelectric developments with some auxiliary steam plants, and the operation of all these plants as a single system so as to effect the utmost economy and produce the maximum amount of power. Such coordinated operation included the connection of all the plants by transmission lines and the exchange of power between plants which can generate surplus power at certain times of the year and those which have a deficiency of power at such periods.[2] The engineers provided surcharge storage on the main river pools of ten feet and on the tributaries of five feet to aid in controlling flood water.

The Tennessee Valley is one of the most underdeveloped sections of the country. Practically all the factors necessary to provide a well-developed economy are present. In addition to the enormous hydroelectric potentialities there are metals, coal and petroleum, chemical pigments, abrasives, ceramic materials, lumber, fertilizer ingredients, and rich farm lands.[3] At present the principal activity

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2. In this analysis, the district engineer assumed that the entire cost of the combined project would be charged to power, except the cost of locks, barge lifts and channel work required solely for navigation. Under these conditions, the average cost of the power was determined to be 4 1/3 mills per kilowatt hour.
3. "Without listing all the minerals which might be economically extracted, it is suggested that iron ore, coal, sulphur, phosphate, potash, lead, and copper have value for the national defense; that zinc, aluminum, and ferro-manganese have electrical uses; that cement, stone, phosphate rock, coal and iron may contribute to river tonnage; that cement, stove, gravel, rock, sand and bentonite are of immediate value for construction purposes; and that manganese ore, barite, phosphate rock, mica, vermiculite, feldspar, and quartz may offer opportunities for further development. (Annual Report of T.V.A., 1936, p.6

of the people in this region is agriculture. There are, however, twice as many people in the Valley as are necessary for the agricultural work. By developing local industries to use the resources of the country, through the stimulus of cheap power and transportation, these people might be put to work to increase the wealth and raise the standard of living of the Valley.

Rainfall and soil are the basic problems in the Tennessee Valley. At present there are badly eroded sections of the country from which the people are trying to derive a meagre living. In sections of the Valley where cotton and tobacco have been cultivated, the soil fertility has been completely destroyed. The steep hillsides have been cleared and cultivated, the topsoil has washed away within a few years, and the farmers have moved on to other hillsides. There are potent illustrations in the Valley of the result of soil wash in the destruction of power reservoirs.[4] The prevention of soil erosion by the withdrawal of land from crop cultivation and grazing, reforestation, and proper methods of cultivation, the use of fertilizer to restore and maintain fertility; and the encouragement of diversified farming are highly essential to the future prosperity of the region.

The Valley is an excellent example of the chaotic results of the individualistic competitive system. Tons of fertile soil have been washed away as a result of the misuse of land. The natural resources of the region have been sadly exploited for private profit. The farm land was exploited by the large cotton planter.[5] The coal, lumber, gas and oil resources were quickly exhausted, but the labor-

4. See Stuart Chase, Rich Land, Poor Land, op. cit.
5. For a description of the destruction wrought by continuous, cotton culture see the article by E. Francis Brown, "The Tennessee Valley Idea", Current History, Vol. 40 (July, 1934), p. 410.

ing population remained and attempted to make a living.[6] During 1934 between fifty to seventy-five per cent of the families of the hill country were on relief. The following picture of financial exploitation is presented by Dr. Morgan:

> "Here in the Tennessee Valley we see evidence of waste in the million or more lots plotted by real estate promotors within reach of Muscle Shoals and sold to unsuspecting persons; and in the ghosts of old lumber towns that work the regions where the primeval forest growth was sawed and sent out with no forethought of later tree crops. For this is a region where raw materials have been handled chiefly as just raw materials and exported as such -- forests as timber, minerals as ores -- a country to exploit rather than a country to build."[7]

It has been stated in the foregoing discussion of comprehensive planning that for purposes of coordination of use of water and land utilization, the drainage basin is the proper unit for administration. A study of the Tennessee Valley indicates, however, that the implications of planning cannot be strictly limited to this area for insofar as power is one aspect of water utilization, the range of the area over which power can be profitably distributed is a significant factor in planning for the development of the region. The potential area of power distribution from the plants on the Tennessee River includes an area much larger than the drainage basin. The cities of Nashville, Memphis, Birmingham and Atlanta are outside the drainage basin but are all within a 200-mile radius of Muscle Shoals and thus offer potential demand for power. The greater part of the power zone

6. A recent survey of the region by the T. V. A. indicates that fifty-two per cent of the land surface of the Valley is in timber -- a total of 13,500,000 acres. Of this total only a fifth can still be classed as of saw-timber character, about two-thirds is in the cordwood class, and the remaining contains growth too small for present utilization. Moreover, the quality of the remaining forest cover has steadily deteriorated through the injudicious removal of the most vigorous growing stock, widespread overgrazing, and uncontrolled and repeated forest fires. (Annual Report of the Tennessee Valley Authority, 1936, p. 62.)

lies in the non-Negro, non-tenant, non-cotton cultivating South. In terms of socio-economic indices, at least seven subregions may be distinguished in the power area.[8]

In 1933, the Federal Government created the Tennessee Valley Authority. The legislation which authorized this action contains broad provisions for economic and social planning in the Valley and the adjacent territory and for the comprehensive development of the land and water resources of the drainage basin. For the first time in the history of national policy with respect to water resources a plan has been adopted for combined development to realize the maximum benefits of the river system. The activities of the Authority will have broad economic and social implications, and the outcome of this experiment will be of great significance in future national water and land policy. The present program for the development of the river has a very complicated legislative history. A study of this history reveals the growing national interest in water resources, the gradual realization of the need for planning, and the multitude of factors which have fought, and will continue to fight, the coordinated development of water resources under Government operation.

7. Morgan, A. E., "Bench-Marks in the Tennessee Valley," Graphic Survey, Vol. 23 (January, 1934), p. 10.
8. "These subregions are the lofty, sparsely settled Blue Ridge Mountains; the fertile and fairly dense and industrial Tennessee Valley; the high-infertile Cumberland Mountains; the fertile and fairly dense Nashville Basin (including the northern Alabama, Muscle Shoals region); the highly industrial Birmingham mining area; the eroded Mississippi Ridge area; and the more fertile Mississippi Bluff area. In addition the regions partially affected are the Mississippi Delta, the southwestern Kentucky tobacco-cattle area, the Shenondoah Valley, and the Cotton Piedmont." (T. J. Woofter, Jr., "The Tennessee Basin", American Journal of Sociology, Vol. 39, (May, 1934) p. 815.)

The Muscle Shoals Problem

In 1925 Senator Neely briefly described the history and problem of Muscle Shoals as follows:

> "More than one hundred years ago President Monroe and his Secretary of War, John C. Calhoun, laid Muscle Shoals like an unwanted child, on the doorstep of the Congress. Ever since the day of its entry into this body it has been a most perplexing, persistent and pestiferous guest. During the past century Muscle Shoals has consumed the time of legislators, marred their parliamentary programs, deluded those who have desired the distribution of its power, and bitterly disappointed every farmer who has ever hoped to enrich his impoverished soil with the fertilizer which could be so cheaply made by a proper utilization of its potentialities. This project has cost the taxpayers of the Nation, including principal and interest, at least a quarter of a billion dollars. Muscle Shoals has proved to be more vexatious and expensive to the American people than the plagues of the frogs and the flies and the locusts and the lice were distasteful and disastrous to the ancient Eygptians who endeavored to perpetuate the bondage of the children of Isreal."[9]

Until the passage of the act creating the Tennessee Valley Authority in 1933, the problem of Muscle Shoals continued to be not only a most "persistent and pestiferous" guest at Congress, consuming a great deal of time in hearings and debates, but was also the subject of widespread propaganda by the various parties and organizations interested in the disposal and use of the Muscle Shoals properties. The legislative history of the T. V. A. probably presents a greater variety of special interests, both economic and political, and interpretations of national interest, than any other single act of Congress. The most predominant figure in this congressional battle was Senator George W. Norris of Nebraska who, as chairman of the Senate Committee on Agriculture and Forestry, was very influential in regard to the bills reported to the Senate and in the defeat

9. Congressional Record, 69th Cong., 1st sess., p. 5206-7.

of bills passed by the House. In every session of Congress from 1922 to 1933 Senator Norris introduced a bill for the use of Muscle Shoals and the development of the Tennessee River under governmental operation. A study of these bills, their reception and amendment by Congress, and the arguments advanced for the acceptance or rejection of the ideas of the Senator from Nebraska effectively illustrates the evolution of the concept of comprehensive development of water resources. Such a study will also show the many obstacles which must be met in the realization of this goal.

National attention was first directed to the Tennessee River in the early part of the nineteenth century in respect to its navigation possibilities. Water transportation was completely obstructed by shoals for a distance of thirty miles above Florence, Alabama, the largest of which was known as the Muscle Shoals. By the act of 1828 the Federal Government granted to the State of Alabama 400,000 acres of public land to be sold and the proceeds to be applied to the improvement of navigation at this section of the river. The original plan of improvement contemplated the construction of a lateral canal the entire distance around the shoals. A canal was built by the State around Big Muscle Shoals, a distance of fourteen miles, but was found to be wholly insufficient and the project was accordingly abandoned. Failure to complete the project rendered water transportation on the river a very hazardous and impractical procedure. Attention was turned to the railroads and the problem of Muscle Shoals and navigation on the Tennessee received no further consideration until after the Civil War and the resumption of control over the river by Congress. In 1873 provision was made for the reconstruction and enlargement of the canal. These improvements cost the Government over

four million dollars. A small amount of traffic developed, but railroad discrimination and control of terminals at the mouth of the river prevented the anticipated increase in commerce and quelled enthusiasm for further improvements.

With the rise of interest in inland waterways during the Roosevelt administration, congressional attention was again turned to the possibilities of the Tennessee as an important tributary of the Mississippi and an artery in the contemplated net of inland waterways. By this time, however, the subject of water power and the disposal of power sites had assumed importance and the problem of navigation at Muscle Shoals soon became entangled with the fight for legislation to protect and conserve water power sites. In 1903 a group of individuals requested the right to build a dam at Muscle Shoals to generate power. A bill was passed by Congress with the provision that the constructions would not interfere with the Muscle Shoals canal.[10] President Roosevelt vetoed the bill, calling attention to the fact that it was his belief that no private right of this kind should be granted and that there should be a general law covering all such grants which would protect the public welfare in valuable natural resources.[11]

The Muscle Shoals Hydro Electric Power Company, a private undertaking,[12] was then organized and acquired all necessary rights from the State of Alabama to develop power at the shoals,[13] and requested permission from Congress to construct a series of dams in the river

10. H. R. 14051, 57th Cong., 2d sess.
11. H. Doc. 427, 57th Cong., 2d sess.
12. A subsidiary of the Alabama Power Company.
13. The state legislature of Alabama also passed a law exempting new power projects from taxation for ten years as an encouragement to this particular project at Muscle Shoals.

for that purpose. As has previously been indicated, any proposition of a private power undertaking whereby improved navigation would result free of charge to the Government was deemed highly favorable. Such a proposition was not acceptable to the power company, however, because of the expense of the undertaking and the risk involved in establishing a market. The company suggested, therefore, that the proposed development be on a cooperative basis whereby the expense would be shared by the company and the Government. In 1907, in the rivers and harbors act, a special board was appointed to survey the canal and existing navigation facilities with a view to permitting the improvement of that section of the river in conjunction with the development of power, and to determine the portion of the expense to be assumed by the Government.

On the basis of the two reports submitted by this board,[14] the officials of the private company, backed by the State of Alabama and business interests in the surrounding territory, attempted to secure the passage of legislation whereby the Government would not only pay for the purely navigation features of the project but would contribute toward the cost of the power development to be repaid later by annual rentals from the power company, on the basis of a hundred year contract with the Government.[15] This proposal was vigorously opposed

14. H. Doc. 781, 60th Cong., 1st sess.; H. Doc. 14, 60th Cong., 2d sess.
15. The power company proposed a 99-year lease, at the end of which period the Government would be permitted to take over the project works at their replacement cost. The first report of the engineers limited the participation of the Government in the enterprise to the estimated cost of improving the canals to meet present transportation needs, which was approximately $8,000,000. Under the plan of the power company this sum would cover the cost of three locks, but would contribute nothing to the cost of the dams. Inasmuch as slack water navigation was superior to the canal, and the development of the power site was urged in the interests of the public welfare

by the conservationists, who felt that the public interest in the valuable power resources of the Tennessee River would be seriously injured by the proposed special legislation. They suggested that action be delayed until the passage of a general water power act defining national policy with respect thereto. For ten years the private company kept their proposition before Congress, but it was overshadowed by broader considerations of future national policy as to the disposal and use of all power sites throughout the country.

In 1916 a more complete report on the improvement of the river at Muscle Shoals was submitted by the Army Engineers, which recommended the construction of three dams. Because of the great potential power development at this section of the river, it was recommended that navigation and power be combined at Dams No. 2 and 3.[16]

(Cont'd) and conservation, the later report increased the amount of government participation -- although not to the extent desired by the company.

The officials of the company wanted the Government to assume a sufficient proportion of the costs to equalize competitive conditions in the distribution of the power. "If the Government recognizes this as a joint project for navigation and power, the Government may assume a large portion of the cost of the length of our dam and bring us on an equality with the Chattanooga power and other powers." (Hearings on the Tenn. River at Muscle Shoals before a House Subcommittee on Rivers and Harbors, 61st Cong., 2d sess., p. 520).

It is interesting to note that the power company anticipated the establishment of private fertilizer companies in the near vacinity of Muscle Shoals which would purchase large quantities of the power. "The market is to be found in recovering the nitrogen of the atmosphere and fixing it as fertilizer, and the statistics are available to this committee to establish this." (Hearings on the Tennessee River at Muscle Shoals before the House Committee on Rivers and Harbors, 63d Cong.)

16. H. Doc. 1262, 64th Cong., 1st sess.

During the same year the national defense act was passed, section 124 of which authorized the President to select a site for the manufacture of nitrates for use in munitions during times of war and for fertilizer during peace times. In accordance with this provision, President Wilson selected Dam site No. 2 as indicated in this report and construction was commenced on the Wilson Dam in 1918. Two nitrate plants were also constructed; nitrate plant No. 2 to develop the cyanamide process which requires large quantities of power,[17] and nitrate plant No. 1 to experiment with the Haber process, which had been developed in Germany but was not completely understood in this country.[18] A steam power plant was also constructed at nitrate plant No. 2.[19] At the close of the war the dam was not finished and the nitrate plants were idle. The total investment in the properties was approximately $145,000,000.[20]

In 1919 the War Department recommended an appropriation to complete the dam and power units. After a brilliant speech by Senator Smoot, who urged that the completion of the dam was only sending "good money after bad", and that the property would always be a lia-

17. Nitrate plant No. 2 had a capacity of 110,000 tons of ammonium nitrate, which is equivalent to 40,000 tons of nitrogen annually.
18. The investment in this plant was a complete loss due to lack of information regarding the details of the process.
19. The steam plant was capable of developing 120,000 horsepower but the installed capacity at the time of construction was only 90,000 horsepower. For a full description of the Government property at Muscle Shoals see Sen. Report 831, 67th Cong., 2d sess.
20. The distribution of this investment was as follows:

Wilson Dam	$64,000,000
Nitrate Plant No. 1	14,000,000
Nitrate Plant No. 2	67,000,000
Total	$145,000,000

bility to the Government, the newly initiated Republican Congress defeated the proposition.[21] The Department of War then made every effort to interest private fertilizer and power interests either in leasing the property or operating it cooperatively with the Government.[22] These private concerns showed no interest in the proposal. Late in the year the Department finally submitted a plan to Congress for the operation of nitrate plant No. 2 by the Government. This plan was embodied in the Wadsworth-Kahn bill which passed the Senate in May, 1920, but Congress adjourned before the bill was considered

21. Work was finally resumed on the Dam, however, and it was completed in 1926, although the full power units were not installed.

22. See the hearings on Muscle Shoals before the House Committee on Military Affairs, 67th Cong., 3d sess., for the attitude of the private interests.

When the Secretary of War attempted to interest Mr. James B. Duke, President of the Southern Power Company, in the proposition, he received the following reply:

"The market for power from the Muscle Shoals Dam has, in my opinion, been overestimated. The demand for power in this district during the war has materially decreased. . . . . The estimates of the price at which power can be sold from Wilson Dam will prove disappointing.

With every desire to assist the Government in the solution of its problem at Muscle Shoals, I am forced by the facts to the conclusion that the Government should lease the permanent work as it is and salvage the construction plant. The Government should then wait until labor and materials render possible the completion of the project at reasonable cost and until there has developed some nearby use for power at the Wilson Dam at an eighty or ninety per cent load factor."(p.117).

The southern power companies (who later submitted a bid for the property) wrote a joint letter, including the following statement:

"Under prevailing conditions and rates for which power is sold under regulation in the southeastern territory the usable primary continuous available power output of the dam and hydraulic power plant at Muscle Shoals cannot be sold, delivered to the public service market at an average price that will pay operating expenses, taxes, reserve for renewals, and replacements, and a fair rate of interest on the estimated cost of the proposed plant, and upon the necessary transportation system to reach the distant and only market." (p. 120).

The fertilizer companies replied that the nitrate plant was obsolete and would be of no value to them.

by the House. In March, 1921, the Secretary of War again requested bids on Muscle Shoals and announced that if he got an offer representing a fair return on the investment necessary to complete the project he would send it to Congress. There was no response from either the power or fertilizer industries and all work was stopped on the dam in April of that year. The project appeared to be dead and was apparently destined for the scrap heap.

The subject of Muscle Shoals did not, however, remain for long in oblivion. On July 8, 1921, Henry Ford made an offer to the Government for the purchase and lease of all the Government property at Muscle Shoals, which bid ushered in a twelve year fight as to the most beneficial disposition or use of these properties "in the public welfare."[23] The Ford offer was given widespread publicity and was received with great enthusiasm by the general public. The bid provided for a hundred year lease and the construction of Dam No. 3 by the Government as well as the completion of the existing project. The Wilson Dam had very little storage capacity. Because of the great variation of stream flow at the Shoals there was, consequently, a large amount of secondary power but little firm power, considering the investment in the dam. The power companies and large industrialists had consistently maintained that the properties were practically worthless for this reason. The construction of Dam No. 3

23. During the period that the use and disposal of Muscle Shoals was being debated, the power generated at the Dam and the steam plant was sold at two mills per kilowatt hour to the Alabama Power Company, the only company having any physical connection with the generating system of the Government at Muscle Shoals. The situation was very unsatisfactory in that all contracts made by the Secretary of War were subject to termination on short notice, and there was only the one bidder for the power. The Secretary was unable to receive a fair and reasonable price for the power while the subject of disposing of the property was under consideration.

(as provided in the original plan of development) some fourteen miles above Wilson Dam would provide a large storage reservoir to regulate stream flow and increase the firm power at Wilson. At the same time, of course, considerable power could be generated at the new dam. The cost of Dam No. 3 was estimated at $32,000,000.

The Ford offer provided for the sale of the two nitrate plants, the Waco quarry,[24] and the steam plant for a consideration of five million dollars. The Government was required to complete Wilson Dam and to install power facilities to generate 600,000 horsepower, and to construct Dam No. 3 with power equipment for 200,000 horsepower. These dams were to be leased to the Ford corporation for a hundred year period on the following terms: For Wilson Dam, the corporation would pay an annual rental equivalent to four per cent of the amount expended by the Government to complete construction (thereby eliminating all past expenditures) plus $35,000 annually for maintenance and operation; the annual rental for Dam No. 3 was to be four per cent of the cost thereof plus $20,000 for operating expenses, and a sinking fund to amortize the cost of the dam in one hundred years. During the first five years of operation, however, the payments were considerably reduced.[25] The total payments by Ford would amount to approximately 2.85% of the capital investment, assuming that all the properties would be completely depreciated by the end of the lease.[26] The Ford company agreed to manufacture fertilizer if there was a de-

24. The Waco quarry, which cost a little over $1,273,000, supplied the limestone necessary for the operation of the nitrate plant.
25. See H. Doc. 167, 67th Cong., 2d sess. for details of the offer.
26. See the articles of Senator Norris, "Shall We Give Muscle Shoals to Henry Ford" in the Saturday Evening Post, May 24 and 31, 1924. Reprinted in the Congressional Record, Vol. 66, Part 1, pp. 107-13.

mand for it at cost plus eight per cent as the maximum net profit.

On February 10, 1922, the House Committee on Military Affairs began hearings on the offer. Just five days later the Alabama Power Company (in conjunction with other utility companies) submitted a bid to the Secretary of War, which was followed soon after by an offer from the Union Carbide Company. The Ford bid was under consideration for several years and brought forth many controversial questions as to the possibilities of manufacturing cheap fertilizer at Nitrate plant No. 2, the desirability of additional government expenditure in Dam No. 3 to salvage the original war-time investment, the proper method of developing the Tennessee River, future national power policy, the rights of Alabama in the Government properties, the "equitable" division of the power from Muscle Shoals, and the economic and political aspects of private versus government operation. The principal controversial questions will be briefly considered before examining the various proposals made for the disposal of the properties and the legislative history of the Tennessee Valley Authority.

The production of fertilizer.

The nitrate plants had been specifically dedicated by law to the production of fertilizer during peace times. This was unfortunate, for the demand for the production of cheap fertilizer to aid the American farmer was used by all the interests opposing the development of power under Government operation and for political purposes to secure the votes of the agrarian interests. The greater part of the hearings and debates were devoted to the fertilizer aspect of the problem and overshadowed the far more important issue of developing

the Tennessee River.[27]

There is no question, of course, but that fertilizer is of considerable importance to the American farmer. It must be used extensively on the tobacco and cotton fields in order to maintain soil fertility, and with the increasing depletion of soils in other parts of the country fertilizer will be an essential part of crop cultivation. At the time the Muscle Shoals problem was under consideration most of the nitrate necessary in the production of fertilizer was secured from Chile at monopoly prices. The so-called "Fertilizer Trust" was held responsible for much of the financial difficulties of the farmers. The argument that the use of Muscle Shoals power for the production of fixed nitrogen would materially lower the price of fertilizer was consequently an effective one. It was argued that the reduction in fertilizer cost would be shared by the farmer and the consumer and that the more extensive use of fertilizer would increase total crops which would add to the general prosperity of the country, increase capital values of farms, increase incomes of farmers and merchants, and tax revenues. Total national wealth would be increased and the public welfare thereby improved.

The crux of the problem was, however, not to establish a national interest in fertilizer, but to show that the Government properties at

27. The attitude of the agrarian interests is expressed in the following statement by the National Grange:
"Muscle Shoals was not intended to be a commercial power project, except as its power is useful for fertilizer making and preparedness purposes. To allow it to become a power project, with the aim of distributing it over a wide area, is equivalent to the surrender by Congress of all that the farmers have fought for and all that was promised them in the authorization of the enterprise. The power at Muscle Shoals once delivered to the Alabama Power Company, or other distributing agencies for public utility purposes will create vested rights on the part of consumers which will jeopardize the farmer's right to use this power for fertilizer purposes." (Congressional Record, Vol. 67, Part 5, p. 5214.

Muscle Shoals would produce fixed nitrogen at low cost. As has previous been indicated, the cyanamide process, using large amounts of water power, was the best process known in this country at the time the nitrate plant was built. At the close of the War, however, the details of the newer Haber process were made known in this country and many improvements were made. By 1924, therefore, the government plant was very much out-of-date and could not produce fertilizer at a cost comparable to the new plants of the Union Carbide and DuPont Companies located at mine heads and using the new processes.[28] Many witnesses appeared at the hearings to discuss this matter of manufacturing fertilizer, the costs of various methods, and the use of patents. A further aspect of the problem of fertilizer was the extent of the market area. Inasmuch as the chemical components of fertilizer are mixed with large quantities of dirt, the transportation costs are high. Considerable time was consumed discussing the possibilities of concentrated fertilizer in order to extend the market area for the Muscle Shoals product and thus confer a national benefit.

The limitation of the market area because of high transportation costs combined with the outmoded cyanamide plant would appear to establish definitely the fact that the American farmer could not be

28. After the War no modern plants were constructed for the production of nitrates where hydroelectric power was used. This was not because power produced by coal was cheaper than water power, but because coal was an essential part of the process of extraction of nitrogen from the air. The coal is converted into coke and is not used for power purposes. The nitrogen is obtained from the air by eliminating from the atmosphere oxygen, and the coke is necessary for this purpose. The only power used in the process is that necessary to operate the machinery.
For details of improvement and cheapening of the process of securing nitrogen from the air and the futility of using the power of Muscle Shoals for this purpose, see Sen. Report 228, 70th Cong., 1st sess.

greatly benefited by the production of nitrate at Muscle Shoals. Nevertheless, the cry of "cheap fertilizer" continued as the most important aspect of the project. According to Senator Norris, this agitation was coming from (1) the political demogogues who wanted the farmers' vote and cried out "cheap fertilizer" for the benefit of the American farmer;[29] and (2) the direct and indirect representatives of the Power Trust.[30]

29. The political appeal to the agrarian interests in illustrated in the following speech in the Senate by Senator Neely of West Virginia:

"While Muscle Shoals should always be immediately available for the production of munitions in time of war, it should in peace be utilized first of all in the manufacture of fertilizers for the benefit of the farmers, whose present financial condition is more deplorable than that of any other class in the country. While the press has boasted of the phenomenal prosperity of the captains of industry and the extraordinary increase of wealth of those who deal in stocks and bonds, under the present and preceding administration the farmers of the nation have, nevertheless, during the same time grown poorer and poorer and apparently lost the greater part of that which other classes have won. . . . .

Let me invite the Senators on the other side of the aisle to atone for their derelictions of the past by helping today to provide for immediate governmental operation of Muscle Shoals to capacity in the manufacture of fertilizer to be furnished to the farmers at the lowest possible cost to the end that they may reclaim their exhausted soil and extricate themselves from the financial slough of dispond in which they have suffered ever since the end of the Wilson administration.

But, Mr. President, I confess that my past experience with the lawmakers of the Nation renders it impossible for me to cherish any optimistic anticipations . . . . No one can be oblivious to the fact that wealth and privilege are more nearly supreme in the United States today than they have ever been before. The country is in the grasp of a materialism as crass as any that Nietzsche ever taught or of which the Kaiser ever dreamed. In the circumstances, the Congress will perhaps succumb to the general clamor for the exploitation of Muscle Shoals by some private concern, instead of authorizing its operation by the Government in the interest of all the people." (Congressional Record, Vol. 67, Part 5, p. 5207-8.)

30. "If they cannot have the power themselves, they would like to have the Government use it for some unprofitable, unscientific business so as to keep out of competition and let them continue their stranglehold which they now have upon the people of the country. (Sen. George W. Norris, "Politics and Muscle Shoals", reprinted in the Congressional Record, Vol. 69, Part 1, p. 801.)

The private fertilizer producers naturally objected to the proposed competition, and endeavored to show that the process was uneconomical and that any fertilizer produced at the government properties would have to be sold at a loss. If the Government or private industry continued to operate the plants at a loss, dumping the product on the market, the private industries could be expected to resent such unfair and discriminatory competition. The American Cyanamide Company led the opposition for the fertilizer industry to the Ford offer. The fact that this company later offered to take over the Government properties would strongly indicate that the use of the Muscle Shoals power rather than the nitrate plants was the attraction.

Construction of additional dams.

Dam No. 3, which was to be about fourteen miles up the river from Wilson Dam and would back up water for a distance of sixty-five miles, was an essential part of the program for development of power at the shoals, and most of the bids for the government property required the construction of the additional dam. By operating the two dams as a unit, the total amount of power could be considerably increased and the value of Wilson Dam augmented by converting secondary power into firm power. In addition, it was known that far upstream, on the Clinch River, was a vast storage site. A high dam at this site, known as the Cove Creek Dam, would hold back flood waters and aid greatly in the regulation of stream flow. By releasing water from this storage reservoir to supplement the low water flow, the firm power at both Dam No. 3 and Wilson Dam would be increased. At such times, considerable quantities of secondary power could be produced which, if connected with the plants downstream, would be of

value. The cost of this dam was estimated at $37,000,000. The Cove Creek site by itself, however, was not an attractive investment for power companies or industrial enterprises. Its value could be realized only when operated in conjunction with the projects downstream.[31]

There was widespread feeling, particularly in the House, that the Government had sunk enough money in the Muscle Shoals undertaking, that it was simply a "white eleplant", which should be turned over to the highest bidder, and by no means should the Government spend an additional $75,000,000 to increase the value of Wilson Dam unless absolutely essential to secure a bidder. This attitude was encouraged by both the fertilizer and power industries. When the Government first requested bids for the property the power companies replied that "neither private capital nor the United States can afford to invest additional public money to complete the dam and hydroelectric power at Muscle Shoals."[32] When it became apparent that the Government probably would spend the money necessary to complete the exist-

31. The effect of storage at Cove Creek on the downstream plants is as follows:

Dam	Primary power from present low-flow of river	Primary increase from storage at Cove Creek	Total
White Creek	14,190 h.p.	42,560 hp.	56,750 h.p.
Chickamauga	32,276	63,840	96,116
Hales Bar[a]	23,856	44,809	68,665
Guntersville	24,897	42,560	67,457
Dam No. 3	42,000	62,000	104,000
Wilson	84,900	112,000	196,000
Pickwick	46,608	62,717	109,325
Aurora Landing	67,200	67,200	134,400
Total			832,713 h.p.

[a] Private power enterprise.
(Source: H. Doc. 185, 70th Cong., 2d sess.)

32. Congressional Record, Vol. 67, Part 9, p. 11102.

ing project, the power companies offered to take it over but they were very disparaging of the value of the project to them.

Comprehensive development of the Tennessee River.

The concept of the comprehensive development of the Tennessee River can be attributed to Senator Norris. Throughout the hearings and debates he consistently urged (1) a comprehensive survey which would locate a series of dams to provide the maximum amount of navigation, flood control and power; (2) the gradual construction of these dams as warranted by the economic conditions of the surrounding territory; (3) the interconnection of the power plants at the various dams; and (4) the operation of this unified system of dams by the Government.[33] Senator Norris' fight for the realization of this ideal development of the river was for many years a single-handed battle. His kindest critics condemned him as an "idle dreamer", and his political enemies accused him of befriending and aiding the private power interests by deliberately attempting to delay congressional action with regard to Muscle Shoals.[34]

With the sole exception of Senator Norris, no consideration was given to the possibilities of complete development of the river system. Those who advocated the construction of Dam No. 3 or Cove Creek Dam did so from the viewpoint of increasing the value of Wilson Dam, rather than as a step in the coordinated utilization and control of the water resources of the Valley. The Senator from Nebraska was successful, however, in securing the rejection of private bids for the property and the consideration of the Norris bills by Congress.

33. See the speech of Senator Norris in the Congressional Record, Vol. 69, Part 3, p. 3441.
34. See the speech of Senator Heflin, ardent supporter of the Ford offer, in the Congressional Record, Vol. 67, Part 2, p. 8706.

The extent to which he was successful in winning adherents to his ideal of comprehensive development will be apparent in the consideration of the Norris bills by Congress.

Future national power policy.

National power policy and the social aspects of the use of electricity played a far more important role in the fight over Muscle Shoals than in the case of Boulder Dam. In the latter case, the revenues from power were expected to reimburse the Treasury for the cost of the entire project. The proponents of the proposed development of the Colorado River placed heavy reliance not only on the self-liquidating aspect of the project by the development of power but also on the excess revenues therefrom which could be used to reconcile Arizona and Nevada and provide a fund for additional river developments. The possibilities of cheap power were, therefore, largely eliminated from the consideration of the Boulder legislation.

In the case of Muscle Shoals, however, a different situation existed. The Government had spent approximately $150,000,000 in the construction of the properties, which was justified as a national defense measure, and, according to law, were to be devoted to the production of fertilizer when not needed for defense purposes. According to expert testimony from the Department of Agriculture and private enterprises engaged in the production of fertilizers, however, the use of Muscle Shoals power to operate nitrate plant No. 2 was very uneconomical and would prove unprofitable. Furthermore, if Dam No. 3 and the Cove Creek Dam were constructed, which would allow the generation of additional power as well as convert the large quantities of secondary power at Wilson Dam into firm power, the problem of disposing of this power was of primary importance. All

of the southern cities and States within transmission distance of 250 miles clamored for their share of cheap power. On the other hand, the territory in the immediate vicinity of Muscle Shoals favored the use of the power for industrial purposes. This cleavage of interest further delayed legislation and introduced the problem of the most beneficial use of the power.[35]

In addition to the comprehensive development of the river for the maximum amount of power, flood control and navigation, Senator Norris also visualized the interconnection of the hydroelectric power plants with the steam plants in the region in a systematic network of transmission lines connected with distributing systems. His

35. This cleavage of interest became apparent in the reaction of the Southern cities and states to the Ford offer. At first there had been apparent unanimous agreement that the offer should be accepted. When the fact was clearly understood, however, that Fordwould use the power for the operation of plants in the vicinity of Muscle Shoals, much of the enthusiasm died out. Demands were then presented to Congress for an "equitable division" of the power. This attitude was greatly stimulated by power company propaganda. The extent of enthusiasm for the Ford offer was directly proportional to the distance the community was removed from Muscle Shoals, as indicated in the following quotations:

"The South, particularly the people of small towns and rural communities in northern and eastern Mississippi will benefit greatly and industry will receive a new impetus if the offer of the southern power companies is accepted is generally predicted. A far-reaching transmission system with power and light available at reasonable cost will be the inevitable result, as well as the manufacture of cheap fertilizer." (Burlington (North Carolina) News, April 8, 1924.)

"An injustice of national ramifications will be done (if Muscle Shoals is given to Henry Ford) but will fall heaviest on Louisiana and Mississippi, because Muscle Shoals is their only hope of securing cheap water power. On this industrial progress in the two States depends." (Columbia (Mississippi) Commercial Dispatch, April 20, 1924.)

primary interest in the power aspect of the river development was the possibility of producing cheap power so that the small domestic consumer and the farmer might realize the advantages of adequate lighting and the use of the many electrical appliances and facilities which were denied them under the high rate schedules of the privately-owned utilities. It was for this reason that Senator Norris vigorously opposed the proposals to lease the Government properties to private industries and the power companies, and staunchly supported Government operation. In this regard, he met with bitter opposition from Southern economic interests who demanded immediate development of the power, with the expectation that it would stimulate industrial growth. Cheap power, to them, was for industry; not for the small consumer and the farmer. Moreover, it was maintained on a number of occasions in the Senate that it was hopeless to attempt to give the people cheaper power inasmuch as the Alabama Power Company had the states in the vicinity of Muscle Shoals tied up. The private power company had the only transmission lines connecting with the Government dam and had long term contracts with the neighboring cities and towns. The whole benefit of cheap power, it was argued, would be realized by the power company.

The yardstick theory was advocated in favor of government operation just as in the case of Boulder. As stated by Senator Norris:

> "Each place (where the Muscle Shoals power is sold) would be a milestone marking the right place, the fair price for electricity, and would be used as a model by the experts and engineers whenever an application was made either for an increase or decrease of electric light rates. . . . .
>
> This legislation will stand out as a guidepost, directing us to the place where we can obtain information, where we will be able to ascertain how much it costs to produce electric power."[36]

36. Congressional Record, Vol. 69, Part 4, p. 4082.

The yardstick theory grew out of these bitter congressional fights over the Boulder project and Muscle Shoals. Its origin is political rather than economic. Inasmuch as state regulation was proving to be very inadequate, any proposition which would aid such regulation met with approval, whereas pure government ownership and operation of power plants was emphatically rejected.

The rights of the States.

The same problem of appropriation of water and natural resources led to protests from Alabama as in the case of the Boulder controversy from Arizona. Alabama maintained that she had an equity in any dam or power plant erected in the river because of ownership of the bed and banks of the river. The state accordingly claimed the right to use the power generated at any such dam, or an equitable share of the proceeds from the sale of power.

As soon as bills were introduced for government operation which contemplated the construction of the Cove Creek dam, the state of Tennessee immediately objected to the use of land and the power site by the government as a loss of taxable property. As stated by Representative Hull of Tennessee, the state demanded:

1) The right to regulate the power generated on the river in Tennessee;

2) A voice in determining the use and distribution of power generated at Government power plants located in the State;

3) A voice in the determination of the power charges; and

4) The right to impose taxes and headwater charges in connection with the power development.[37]

37. Congressional Record, Vol. 69, Part 8, p. 8222. Also see the speech of Senator McKellar of Tennessee of states' rights, in the Congressional Record, Vol. 69, Part 9, pp. 9836-7.

In accordance with its views on the Boulder project, the state of Arizona objected to the Norris proposals for government operation of the Muscle Shoals properties as an invasion of states' rights. As stated by the Arizona Corporation Commission:

> "Perhaps the most startling feature, and the one most objectionable, is the proposal to further curtail States' rights. The question of distribution of the power should be a matter for the various states concerned to decide, who are thoroughly familiar with local conditions and who would know the needs of the communities and peoples to be served."[38]

The situation at Muscle Shoals was not, however, exactly analogous to that at Boulder. The Tennessee River was not only navigable by law but also in fact. Dam No. 1 had been constructed solely for navigation purposes, Wilson Dam was equipped with locks and the construction of Dam No. 3 would provide a nine foot navigable channel for a considerable distance up the river. The construction of Cove Creek would aid navigation by regulating stream flow. Insofar as any structure definitely aided or was intended to aid navigation, the rights of the States to the bed and banks of the river were definitely subordinate to the supreme power of Congress.[39] As in the case of Arizona, the chief objection of Alabama and Tennessee was the loss of revenue. They were willing to be reconciled to the alleged invasion of states' rights upon a guarantee of payments "in lieu of taxes."

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38. Ibid., Vol. 67, Part 5, p. 5201.
39. The Supreme Court had definitely stated in a number of cases that the title to the bed of a river was always subordinate to navigation.
    "It (the title) is subordinate to the public right of navigation, and however helpful in protecting the owner against the acts of third parties, is of no avail against the great and absolute power of Congress over the improvement of navigable rivers. . . . . If in the judgment of Congress, the use of the bottom of the river is proper for the purpose of placing therein structures in aid of navigation, it is not thereby taking private property for a public use, for the owners'

Private vs. public operation.

Probably the fundamental question in the Muscle Shoals controversy was that of public vs. private operation of the properties. All of the Norris bills provided for governmental operation, either by a specially created public corporation or the executive departments of War and Agriculture. All the other proposals for the use of the Government properties turned them over to private industry under a leasing arrangement. The House consistently showed its opposition to public operation and was inclined to be lenient in the terms of the lease. The majority of the Senate, on the other hand, was sufficiently influenced by Senator Norris to accept governmental operation if the private bidders refused to accept terms which would safeguard the public interest in the production of fertilizer and the distribution or use of the surplus power.

The arguments in opposition to government ownership were based on the general principles of laissez-faire and the disastrous results of government competition with private industry. All of the advantages of free private enterprise were reiterated on numerous occasions, and the proposals for government operation at Muscle Shoals were viewed as a "socialistic" step which would open the door to communism and reduce our prosperous, free democratic nation to a state of chaos.[40] A more specific objection to the Norris bills was

(Cont'd) title was in its very nature subject to that use in the interest of public navigation." (U. S. v. Chandler-Dunbar Co., 229 U. S. 53, p. 62.)

Also see Scranton v. Wheeler, 179 U. S. 144; Wisconsin v. Duluth, 96 U. S. 379; and South Carolina v. Georgia, et al, 93 U. S. 4.

40. This attitude is expressed by Senator Heflin as follows:
"I want to give any patriotic citizen an opportunity to bid for and take hold of and operate this project for the good of those who will use the fertilizer produced there, while the Senator from Nebraska would have the Government do that. When he does that he is setting the Government up in business;

that the Government would be competing with the private power and fertilizer industries and, because of its ability to recoup losses from general taxation, would drive the private interests into bankruptcy.[41] Government operation was also condemned on the ground that it would be inefficient and inevitably would become corrupted by politics. In refutation of this argument, the Norris supporters presented examples of successful municipal power enterprises. The Ontario Hydro project was frequently presented as an example of the possible development and use of Muscle Shoals power. Government

(Cont'd) it becomes a precedent; so when other things come along somebody else will want the Government to take them over, and almost before we know it, perhaps, all of the big concerns of the country will be run by the Government, and private enterprise will be choked and stifled." (Congressional Record, Vol. 67, Part 1, p. 365.)

"Individual enterprise and effort and individual initiative and individual ownership of some tangible thing constitute in part the proud birthright of the real America. The incentive to achieve something in your own name and to have and exercise ownership over some kind of property is an inspiring influence in the life of everyone worth while. I am opposed to putting the Government in competition with its citizens. It is the socialistic doctrine which some Senators are encouraging." (Ibid., Vol. 66, Part 1, p. 20.)

For a complete presentation of this argument see the speech of Senator Tydings against Government operation. (Ibid., Vol. 69, Part 8, pp. 9794-9808.)

41. As stated by Representative Eaton of New Jersey:
"I am not willing as a Member of this House to sit silently by and see this industry confiscated and destroyed by action of our Government, which was created for the express purpose of guaranteeing this and all other industries and persons in the rights belonging to every American citizen. I believe the farmers of this country would be the first to protest against such legalized robbery and oppression. Our farmers want and need good and cheap fertilizers, but they can ill-afford to obtain these fertilizers by agreeing to the acceptance of a governmental principle and practice under which their own property and the property of any other private citizen could be confiscated at the will of a Federal bureaucracy. . . . . This bill puts the United States Government squarely into the power business and the fertilizer business. Both proposals are contrary to the genius of our political and economic institutions and are fraught with serious menace to the prosperity and progress of our people." (Ibid., Vol. 69, Part 8, p. 8223-4.)

operation also gained adherents from the fact that the opposing private interests were powerfully organized industries, commonly referred to as the Fertilizer and the Power Trust.

The private fertilizer and power interests maintained powerful lobbies in Washington and engaged in a nation-wide campaign to strengthen the opposition to government operation. The revelations of the Senate Committee on Lobbies[42] and the Federal Trade Commission[43] as to the activities of these private interests in influencing public opinion to defeat legislation led many congressmen to accept government operation as the only possible means of protecting the public interest in the Muscle Shoals property.[44]

Legislative History of the Tennessee Valley Authority

The Ford bid, along with the offers of the power companies, the Union Carbide Company, and various private individuals was under consideration and fiercely debated for three years. The power companies[45] offered to lease the hydroelectric and steam properties of the Government for fifty years at two million dollars per annum.[46] All renewals and repairs were to be made by the companies. Dam No. 3 was to be constructed by the lessees, in accordance with their own plans and specifications, but the cost of the project was to be borne by the Government. The annual rental for the use of the dam

42. Sen. Report 43, 71st Cong., 2d sess.
43. Sen. Doc. 92, 70th Cong., 2d sess.
44. The spread in price between that charged the Alabama Power Company by the Government for power from Muscle Shoals, and the retail price of the Company for domestic purposes also aided the cause of the government operation group.
45. The Tennessee Electric Power Company, the Memphis Power and Light Company, and the Alabama PowerCompany.
46. This is interest at four per cent on $50,000,000, which included the $45,500,000 total estimated expenditure on the hydroelectric project and $4,500,000 for the steam plant. During the first six years of the lease, however, the payments were to be materially reduced. For details of the offer see H. Doc. 158, 68th Cong., 1st sess.

was fixed at four per cent of the cost of construction. If the Government would not provide for the construction of this dam, the power companies were to be permitted to do so, under the terms of the water power act. In such case, it was provided that one-third of the cost of the project would be borne by the Government as the value of the navigation improvements in the Muscle Shoals section of the river. The recapture provisions of the water power act were to apply. The power interests further agreed to establish a million dollar fund for electro-chemical research, and to supply a limited amount of power at cost for use in the production of fertilizer.

The power interests realized that their offer would not be considered if confined to the power aspects of the project alone. An additional offer was submitted, therefore, providing for the creation of a five million dollar corporation for the production of fixed nitrogen (by any process which had been commercially developed) and for the manufacture of phosphoric acid.[47] This corporation was to produce a specified annual amount of fertilizer if it could be sold at cost plus eight per cent "of the fair, actual annual cost of production". The power companies agreed to pay rental for nitrate plant No. 1 and to keep nitrate plant No. 2 ready for use at any time, the total cost of which would be included in the sale price of the fertilizer. It should be noted that the power lease was in no way contingent on the use of the nitrate plants or the production of fertilizer. If fertilizer could not be sold at eight per cent profit, the companies were under no obligation to continue production, but would have full use of the power properties for fifty years.

47. For the details of this proposition, see H. Doc. 173, 68th Cong., 1st sess.

The Union Carbide Company offered to lease the nitrate plant, the Waco quarry and a yearly average of fifty thousand horsepower for a period of fifty years.[48] The annual rental for the property was set at $150,000 and the price of power at nine to fifteen dollars per horsepower per annum. The company agreed to sell fertilizer on a cost plus five per cent basis. This offer received little consideration in that it provided for only a partial utilization of the available power and the annual rental was extremely unfavorable to the Government.

A proposal for a partnership with the United States was made by Elon H. Hooker, president of the Hooker Electrochemical Company; James G. White, president of a utility management company; and W. W. Atterbury, vice-president of the Pennsylvania Railroad Company. They agreed to form a million dollar corporation, in which they would hold the controlling interest, to which would be leased all the Muscle Shoals property for a fifty year period.[49] The agreement was to provide for the completion of the property and the construction of Dam No. 3 at the expense of the Government. All taxes were to be rebated to the corporation and all expenses of operation of the fertilizer plants were to be paid by the United States in advance.[50] The corporation was to be allowed as profit on the manufacture of fertilizer an annual amount equal to eight per cent of the current sales price of all fertilizers manufactured by the corporation during the year. The total cost of the dams and power facilities were to

48. See H. Doc., 68th Cong., 1st sess.
49. See Senate Bill 2747, 68th Cong., 1st sess.
50. Operating expenses were to include administration, maintenance, repairs, reconstruction costs necessary to keep abreast of the art, and working capital for all purposes, including raw materials, labor, storage, distribution and sale; it being at the option of the United States to discontinue operation of such fertilizer plants when conducted at a loss.

be amortized within fifty years out of net earnings, after providing for an eight per cent dividend on the company's preferred stock. After providing for these deductions, all remaining net revenues were to be divided between the United States and the common stockholders, the later to receive one-third of all such net revenues during the first ten years of the lease, and one-fourth thereafter.

Considerable time at the hearings on Muscle Shoals in 1924 was directed to a discussion of the terms of this proposal. The lessees indicated that the proposition amounted to a sacrifice on their part in that it would be a very difficult administrative task, but they were willing to undertake it. It would appear, however, that the advantages were all on their side inasmuch as they would have gained control over a $200,000,000 public investment for a paltry consideration, all operating expenses to be borne by the Government, with the controlling stock in the corporation to be held by them which could be sold at any time. The witnesses maintained that such a partnership arrangement would assure the Government of the most efficient arrangement of the properties which could possibly be attained and an opportunity to realize a profit on the war-time investment. Under government operation, according to their argument, management would be highly inefficient, losses would inevitably result, and the management would be susceptible to political machinations. The individuals concerned in this proposal would not consider giving the Government fifty-one per cent of the stock in the corporation, or allowing any restrictions on the sale of their holdings for that would destroy the market value of their stock.[51]

51. When asked by Senator Norris as to whether they would object to changing their bid so that 51% of the stock would be owned by the Government, Mr. Hooker replied: "Yes, I would, Senator, I would not want to have anything to do with it under those

The bill introduced by Senator Norris in the Sixty-Seventh and again in the Sixty-Eighth Congress contained the following essential provisions:[52]

1) Incorporation of the Federal Chemical Corporation by the Federal Government to operate the publicly owned properties. The corporation shall have a board of directors consisting of three persons to be appointed by the President and confirmed by the Senate.

2) Completion of Dam No. 2, the hydroelectric plant and the steam plant for full utilization, and construction of Dam No. 3. Furthermore, the Secretary of War was instructed to survey the Tenn. River and its tributaries for the purpose of locating suitable storage reservoirs in order to provide for a larger amount of primary power at Dams No. 2 and 3. The Secretary was to be granted authority to construct such storage dams "where practical storage reservoirs can be obtained at reasonable cost," and all privately owned downstream plants were to pay headwater charges for the increase in primary power. All such reservoirs would be operated by the government corporation.

3) The corporation was authorized to produce complete fertilizers and to establish agencies for their sale direct to farmers and farm organizations. Wherever the chemical components of fertilizer were sold to manufacturers, the retail price of the final product would be specified by contract.[53]

(Cont'd) conditions, because immediately political parties would have a right to feel that they could bring politics into it, and I don't think we could make money for the Government under those conditions." (Hearings before the Senate Committee on Forestry and Agriculture on Muscle Shoals, 68th Cong., 1st sess.)

52. S. 3240, 67th Cong., 2d sess.; S. 2372, 68th Cong., 1st sess.

53. One of the declared objects of the bill was "to prevent a monopoly of the fertilizer business or the undue and unreasonable advance in the price of fertilizer."

4) All surplus power (not required in the manufacture of the fertilizer) shall be sold; first, to State, counties, and municipalities; and secondly, to private individuals and corporations. Whenever sold to private power companies, the sales contract may provide for the resale price of such power.

It will be noted that the bill made no provision for the sale price of fertilizer or the distribution of power revenues.

The House was very enthusiastic about the Ford offer and showed little inclination to consider other proposals for the operation of the properties. The Senate, on the other hand, was skeptical about turning this property over to Ford for a meagre return on a hundred year lease, with no guarantee of fertilizer production or regulation of the use of power.[54] In 1923 and again in 1924 the House Committee favorably reported the Ford bid, which was embodied in the McKenzie bill.[55] The bill passed the House in 1924 by a big majority. It was then referred to the Senate Committee on Forestry and Agriculture. Extended hearings were held by the Committee, but before any formal action was taken, Ford withdrew his offer. This led to a very complicated legislative battle, during which Senator Norris was critized by many of his colleagues in Congress for delaying action on the Muscle Shoals question.

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54. In 1922 the Senate Committee reported to reject all bids for the present time. All the bids except that of Ford were unanimously rejected. On the Ford bid the committee stood seven to nine. Five members of the committee were in favor of the Norris bill. (Sen. Report 831, 67th Cong., 2d sess.)

55. H. R. 518, 68th Cong., 1st sess. The bill was supported by the American Farm Bureau Federation, the National Grange, the Farmers' Educational and Cooperative Union of America, the American Federation of Labor, the Mississippi Valley Association, the American Legion, and many States in the south and west.

The committee finally reported the Norris bill but the Senate voted to substitute the Underwood bill in its place for consideration. The Underwood bill was an administrative measure, having the full approval of President Coolidge and the Secretary of War. This bill gave broad discretionary powers to the Secretary of War to lease the properties.[56] The only specific stipulations were as to the amount of fertilizer to be produced, which provision was largely nullified by permitting the lessee to stop production if the product could not be sold at cost plus eight per cent, and the annual rental for the properties. Dam No. 3 was to be constructed and the resale price of fertilizer regulated. There were no requirements whatsoever as to the use or sale of the power.[57] If a lessee could not be secured within a year, the property was to be operated by the Government. There was a general feeling, however, that the terms of the bill could be easily met by either the southern power companies or the American Cyanamid Company.

After some discussion, the Jones bill was substituted for the Underwood bill. The Jones bill provided for immediate construction of Dam No. 3, but proposed to delay legislation until a detailed report had been submitted by a committee, investigating the proposals and questions involved in the use and disposition of the water power resources and property of the United States at Muscle Shoals. Senator Norris immediately offered his bill as a substitute for the Jones bill, and it was accepted by a vote of forty-to thirty-nine.

56. A copy of the Underwood bill is printed in the Congressional Record, Vol. 66, Part 1, pp. 1809-11.

56. The only reference in the bill to the sale of power was that such power "when sold or used shall be subject to the laws, rules and regulations relating to the sale and use of electric power in the several States in which said power is used.

Whereupon, Senator Underwood resubmitted his bill to substitute the Norris bill and the motion passed by a fifty-two to twenty-two vote. This merry-go-round of bills is indicative of the existing state of confusion on the subject of Muscle Shoals. The vicious circle was finally stopped by the rejection of the Jones bill as a substitute for the Underwood bill. Senator Norris led a determined fight against the bill and many amendments were offered to stipulate the obligations of the lessee but failed to pass the Senate. The bill was finally accepted without amendment. A conference committee of the two Houses was then faced with the problem of reconciling the Underwood and the McKenzie bills. Many changes were made, all of which were to the advantage of the lessee, such as striking out the provision which gave Congress the right to amend, alter or repeal the act; permitting the lessee to make other products in lieu of nitrogen; granting the lessee preferential right to perpetual use of the property; requiring the Government to pay replacement value of all improvements; lessening the amount of fertilizer to be produced; and reducing the annual rental. In fact, the terms of the lease were liberalized to such an extent that the Senate refused to consider the bill. Thus another session of Congress closed with no action on Muscle Shoals.[57]

In 1926 a joint committee was created to solicit and consider bids for Muscle Shoals.[58] Every effort was made by the committee to

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57. In 1926 bills similar to the Underwood bill, providing for leasing of the property again passed both Houses. Enactment of the conference bill was prevented in the Senate at the eleventh hour by Senator Norris on a point of order.
58. H. Con. Res. 4, 69th Cong., 1st sess.

give wide publicity to the subject.[59] Bids were again submitted by the power companies,[60] the Union Carbide Company,[61] and Elon H. Hooker and associates;[62] and additional offers were received from the Air Nitrates Corporation (a subsidiary of the American Cyanamid Company); Frederick T. Hepburn (president of H. D. Walbridge Company, investment bankers in New York City); F. E. Castleberry,[63] Lloyd H. Smith,[64] C. E. Graff, James H. Levering,[65] and the Birmingham Real Estate and Improvement Company.[66]

The Air Nitrates Company, a subsidiary of the American Cyanamid Company, proposed to lease the Government properties for fifty years.[67] The Government was required to construct Dam No. 3 and Cove Creek Dam and give the private company the right to construct additional dams at any time on the Clinch River for storage and power purposes.[68]

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59. The report of the joint committee, which includes the detailed bids and analysis thereof, was printed as Sen. Report 672, 69th Cong., 1st sess.
60. The power companies' offer remained the same as submitted in 1924, providing for the two separate leases. The power properties were to be leased to the Muscle Shoals Power Distributing Company, and the nitrate plants to the Muscle Shoals Fertilizer Company.
61. The Union Carbide Company submitted two proposals but recommended that the properties be leased to the Air Nitrates Co., with whom the company had effected an agreement for the joint use of the power. In its own bid, the Union Carbide required that the Government should protect it in the use of patents and placed a limitation of 20,000 tons on the amount of fixed nitrogen to be produced.
62. The same as submitted previously.
63. The bids of Frederick T. Hepburn and F. E. Castleberry were substantially the same as that of Hooker and associates, providing for the operation of the properties by them as agents of the Government.
64. The offer of Lloyd H. Smith did not provide for the production of any nitrates.
65. The offer of James H. Levering and C. E. Graff of the American Nitrogen Products Company proposed to lease but a portion of the properties.
66. The bid of this company was received too late for consideration.
67. See Sen. Doc. 209, 69th Cong., 2d sess.
68. These dams as specified in the bid were the Senator Dam, the Melton Hill and Clinton Dams, as outlined in the Army Engineers' report of 1916.

The Company agreed to produce an annual total of forty thousand tons of fixed nitrogen on condition that the company was successful for three successive years in selling the full product of the first unit of the concentrated fertilizer at cost plus eight per cent. The Company agreed to distribute all surplus power not required for production of fertilizer or by affiliated companies or otherwise used in local industry. It was generally understood, however, that the American Cyanamid Company and the Union Carbide Company expected to use all the available power for industrial purposes. In the letter addressed to the Joint Committee on Muscle Shoals in 1926 the company explained that its purpose in making the offer to produce fertilizer was to use the surplus power for varied industrial operations and stated that if Congress, in accepting its offer to make fertilizer, should "restrict the company's operation in other fields, either as to character or profit, the company will be unable to proceed with the plan above outlined under such restrictions."[69] At the hearings the company's officials stated that they had been unable to effect an agreement with the southern power companies to take part of the power, but had successfully contracted with the Union Carbide Company to sell then fifty thousand horsepower at seventeen dollars for the private use of the company.

As royalty the company proposed to pay four per cent on all governmental expenditures for power projects after May 31, 1922, thereby eliminating from the royalty basis the war time expenditure. No return was to be made by the nitrate plants. Including the war time expenditures (exclusive of purely navigation structures and the nitrate plants) the annual return from the company would have

69. H. Doc. 980, 69th Cong., 1st sess., p. 174.

amounted to only 2.6%. Only nominal payments were to be made during the first six years of the lease. The additional capital expenditure required by the Government was approximately eighty million dollars. Although the Cyanamid Company bid found many supporters in the House, it was rejected on the ground that it failed to give the government adequate "recapture" provisions and that it did not provide for auditing and checking of the company's accounts to insure the truth as to the cost of fertilizer.[70] The Senate objected to the failure of the bid to safeguard the public interest in the power resources. Throughout this entire controversy the House centered attention on the fertilizer aspect of the proposition, whereas the Senate was more interested in the power possibilities of the project. The majority of the joint committee recommended that the offer of the southern power companies be accepted,[71] but it was not reported by either the House or Senate committees.

By this time, Senator Norris recognized the utter futility of attempting to secure passage of a bill for the complete development of the Tennessee River. There was opposition in his Committee and in the Senate to additional expenditures for such a purpose. The War Department, the Federal Power Commission, the House of Representatives and the President disapproved of government operation of the project. The only administrative agency which favored government operation was the Department of Agriculture. At the same time, the opponents of government operation were gradually realizing the futility of an attempt to turn these properties over to either a private chemical or power company. The growing disapproval of the

70. See the Congressional Record, Vol. 69, Part 8, p. 8469.
71. H. Report 980, 69th Cong., 1st sess.

financial practices of the utility holding companies, the demand for cheap fertilizer, and the disclosure of the lobbying activities of the power and fertilizer associations prevented the passage of such a bill.[72]

Consequently, the Norris bill which was reported from the Senate Committee in 1928 provided for government operation, but was very much of a compromise with the opposition.[73] The bill provided for the completion of the power units at the Wilson Dam and the steam plant, but for no additional dams or storage reservoirs. Operation of the power units was to be turned over to the Department of War. The primary purpose of the project was the production of fertilizer and experimentation in the various methods of producing nitrogen, which would be conducted by the Department of Agriculture. All surplus power would be sold, giving preference to municipalities, under ten-year contracts.[74] The War Department was given the right to lease or construct transmission lines. If the power were sold to corporations for resale, the Federal Power Commission was to fix the resale price. All revenues from the sale of power and fertilizer were to go into a special fund for developing the manufacture of

72. There was general suspicion of the cost-plus provision in the bids of the private companies. As stated by Senator Smith in 1926, "With this power developed and the machinery installed, ready to carry out the solemn mandate of a statute now on the books for the benefit of agriculture, having expended this amount of money for a definite and specific purpose, we are now to turn it over to a private corporation under a lease under the implied terms of which not only may the product be sold at whatever the company may deem is its cost, but we commit ourselves to eight per cent profit. It is the old, iniquitous, indefensible cost-plus contract." (Congressional Record, Vol. 67, Part 5, p. 5203.)

73. S.J. Res. 46, 70th Cong., 1st sess.

74. The resolution stated that it was declared to be the policy of the Government to distribute surplus current equitably among the States within transmission distance of Muscle Shoals.

fertilizer and improving the methods of crop cultivation.[75]

The Morin bill, which was considered in the House in place of the Norris bill, differed from the latter in that it provided for the creation of a government corporation to administer the properties, the construction of Cove Creek Dam, and the full and continuous use of nitrate plant No. 2. The Morin bill did not give preference to municipalities in purchase of surplus power. The fertilizer was to be sold at cost during the first five years of operation and at cost plus five per cent on additional capital expenditures thereafter. The calculation of cost was not to include any item for the previous governmental expenditures. If this fertilizer was sold to intermediaries, the resale price should be established by contract. In spite of the fact that the House had been advocating "cheap fertilizer" for eight years as the primary purpose of the project during peace time, there was immediate objection to the Morin bill in that it would disastrously affect the existing three hundred million dollar investment in the private fertilizer industry.

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75. It was contemplated by Senator Norris that the existing nitrate plants would not be used for the manufacture of fertilizer, but that new plants using the improved methods would be used. Most of the power generated at the project would be sold rather than used in the production of fixed nitrogen. The profits from the sale of power, however, would be devoted to fertilizer production. As stated in the committee report: "The committee feels that by the sale of electricity generated at Dam No.2 and the government steam plant at Muscle Shoals the profits accumulated from such sale will result in a much cheaper production of fertilizer than though the power itself were used in the production of fertilizer according to the methods that are now obsolete and out of date." (Sen. Report 228, 70th Cong., 1st sess.)

When the two bills went to the conference committee, a compromise was effected on the fertilizer issue, and the provisions of the Morin bill as to administration and the construction of Cove Creek Dam were accepted by the Senate conferees.[76] The Senate objected to the Cove Creek provision in that this additional expenditure might give more reason for a presidential veto. The representatives from Tennessee vigorously objected in that the bill made no provision for a payment to the State for use of its resources.[77] After some difficulty in both Houses, the compromise bill finally passed, but met a quiet death at the hands of President Coolidge by a pocket veto.

In the following year the House Committee again showed its opposition to government operation by favorably reporting the Cyanamid Company offer,[78] although the proposal had been previously rejected by various House and Senate committees on five different occasions.[79] In 1930 Senator Norris submitted a bill which was identical with the conference bill of 1928 which had been vetoed, with the single addition that five per cent of the revenue from the sale of surplus power was to be paid to the States of Tennessee and Alabama.[80] It was well known that President Hoover was not sympathetic toward govdrnment operation at Muscle Shoals. Senator Norris accordingly rejected such amendments as the construction of Dam No. 3 and lengthening of the contract period for municipalities for fear of

76. H. Report 1786, 70th Cong., 1st sess.
77. See the speech of Senator Tyson, Congressional Record, Vol. 69, Part 9, pp. 9717-21.
78. H. Report 2564, 70th Cong., 2d sess.
79. Representative Morin, the chairman of the committee, wrote a dissenting report and favored government operation.
80. Senator Vandenburg wanted to strike out this five per cent clause. His amendment to that effect was defeated by a vote of 42 to 34.

forcing a veto. The only amendment accepted in the Senate was that the contract to a municipality would be void if there were discrimination between consumers of the same class.[81]

The House Committee displayed its opposition to government operation by substituting the Reece bill for the Norris resolution. The House still maintained the position that Congress had not yet exhausted every effort to secure a lease from private industry. The Reece bill therefore set forth certain conditions under which the President might lease the property to one or more individuals. The nitrate properties, however, had to be leased prior to the power lease.[82] In case no lessee could be found within a year and a half, the provisions of the Norris bill of 1928 were to go into operation. The Reece substitute passed the House by a vote of 186 to 135. A compromise was effected in the conference committee, providing for the lease of the nitrate properties within a twelve months period but not of the power project. If no lessee had been found at the expiration of this period, the provisions of the Norris resolution were to be effective. Inasmuch as previous bidders had offered to take the nitrate properties and manufacture fertilizer only as a necessary condition of securing the power, the leasing provisions would seem to be ineffective.[83]

81. The purpose of this amendment was to prevent if possible the sale of all the power to nearby industrial establishments on extremely favorable terms.

82. See the Congressional Record, Vol. 72, Part 9, pp. 9728-34, for the conditions of the leases.

83. The House conferees were very optimistic, however, about the leasing provisions and asserted that the Senate resolution would never go into effect.
"The leasing language is so liberal that the President will be able to effectuate a lease, thus consuming all of the power distributable at Muscle Shoals, leaving little, if any, plwer for sale, or sale and distribution, under the provision of the Senate joint resolution." (H. Report 2747, 71st Cong., 3d sess.)

The conference bill was passed in both Houses, but, for the second time in the legislative history of Muscle Shoals, was vetoed. This time, however, the veto was made in no uncertain terms. Looking at the project as a purely commercial enterprise, President Hoover calculated that the project could not be operated to show a profit on the capital outlay. Considering the fact that this outlay had already been made, the question of profit would hardly seem to be a legitimate argument. President Hoover's real objection was to government operation, as is indicated by the veto message:

> "I am firmly opposed to the Government entering into any business the major purpose of which is competition with our citizens. . . . . There are many localities where the Federal Government is justified in the construction of great dams and reservoirs, where navigation, flood control, reclamation, or stream regulation are of dominent importance, and where they are beyond the capacity or purpose of private or local government capital to construct. . . . . But for the Federal Government to go out to build up and expand such an occasion to the major purpose of a power and manufacturing business is to break down the initiative and enterprise of the American people; it is destruction of equality of opportunity amongst our people; it is the negation of the ideals upon which our civilization has been based.
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> The power problem is not to be solved by the Federal Government going into the power business, nor is it to be solved by the project in this bill. The remedy for abuse in the conduct of that industry lies in regulation and not for the Federal Government entering upon the business itself. . . . . I hesitate to contemplate the future of our institutions, of our Government, and of our country if the preoccupation ofits officials is to be no longer the promotion of justice and equal opportunity but is to be devoted to barter in the markets. This is not liberalism, it is degeneration. . . . .
>
> The bill distinctly proposes to enter the field of powers reserved to the States. It would deprive the adjacent States of the right to control rates for this power and would deprive them of taxes on property within their borders, and would invade and weaken the authority of local Government."[84]

In view of this strenuous objection of the President to government operation as contemplated in the Senate resolution, and considering

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84. Sen. Doc. 321, 71st Cong., 3d sess.

that the bill itself had been very much of a compromise, Senator Norris made no further effort in regard to Muscle Shoals during the Hoover administration.

By the time President Roosevelt assumed office, the stage was set for decisive action with regard to Muscle Shoals. The House and Senate had already twice shown their willingness to accept government operation but, under the leadership of the Republican party which had steadfastly shown allegiance to monied interests, vested rights and the freedom of enterprise, they would not accept the complete program of Senator Norris for comprehensive development of the river system. The combined forces of the shift of control in both Houses to the Democrats; the inaugeration of a powerful chief executive who had always shown great interest in the possibilities of cheap power under government operation and was an ardent conservationist; the popular demand for action to provide employment and check the depression; the gradual realization of the results of a free competitive system which had led to concentration of industry, depletion of soil resources and misuse of water resources; and the publication of the Army Engineers' survey of the Tennessee River system; all opened the way for a broad program of development of the Tennessee Valley.[85] Prior to inaugeration, the President indicated that he

85. The gradual change of attitude in favor of planned development is indicated in the following statement:
"In the case of the Tennessee River Valley, not yet so definitely set in an industrial world, there is an opportunity to seize the course of technical evolution at an earlier stage. Here is a great hydroelectric plant at Muscle Shoals, the potential power of which is yet far from being utilized. Its stable capacity may be stepped up considerably by further improvements in the river. The old way, stubbornly sought by the power interests for years, would have been to turn it over to private capital for profitable exploitation, and thus to dedicate the whole future of the region to haphazard and uncoordinated development. How the power should be used; whether it should be the basis of overcrowded industrial cities

visualized for the Tennessee Valley "a vast internal development encompassing reforestation, reclamation, water power, and agricultural rehabilitation. The aim is to balance the national population anew between cities and the country."[86]

On April 10, 1933, the President sent a message to Congress outlining desirable legislation for the Tennessee River which set the legislative machinery into action. The following quotation from this message is indicative of the change of attitude regarding Muscle Shoals and the proper method of developing a drainage basin:

> "It is clear that the Muscle Shoals development is but a small part of the potential usefulness of the entire Tennessee River. Such use, if envisioned in its entirety, transcends mere power development; it enters the wide fields of flood control, soil erosion, afforestation, elimination from agricultural use of marginal lands, and distribution and diversification of industry. In short, this power development of war days leads logically to national planning for a complete watershed involving many States and the future lives and welfare of millions. It touches and gives life to all forms of human concerns. . .
> It (the Government corporation) should be charged with the broadest duty of planning for the proper use, conservation, and development of the national resources of the Tennessee River drainage basin and its adjoining territory for the general social and economic welfare of the Nation."

Both bills introduced into Congress, the McSwain-Hill bill in the House, and the Norris bill in the Senate, incorporated the broad principles outlined by the President. The provisions of the House bill were as follows:[87]

1) Creation of the Tennessee Valley Authority, with three members on the board, to be appointed by the President with the con-

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(Cont'd) at the expense of high-cost energy for farms and homes, whether the values it creates should be drained off largely in real-estate speculation, whether anything should be done to control floods and protect watersheds -- all these things would have been left to the chance of decisions made in search of profit." (Editorial, "The Tennessee Valley Plan", New Republic, Vol. 74 (February 15, 1933), p. 5.)

86. Washington Evening Star, February 2, 1933.

87. H. R. 4081, 73d Cong., 1st sess.

sent of Senate. This agency shall be granted full powers of a private corporation.

2) The Authority was to be granted power to develop the Tennessee River in a comprehensive manner, building dams, power atructures and navigation facilities. For each dam constructed a sinking fund was required which would amortize the entire cost of the dam, including power house and locks, over a period of sixty years. A two per cent interest payment was required for all money derived from the Treasury to construct such facilities. Cove Creek Dam was to be constructed immediately.

3) The board was directed to manufacture fertilizer ingredients under any process deemed desirable and arrange with farmers and farm organizations for the large scale use of the new fertilizers. Any of the properties, either existing or constructed later, for the production of fertilizer could be leased at any time by the board under certain conditions specified in the bill.

4) The surplus power was to be sold, granting preference to States, counties, municipalities and cooperative organizations of citizens and farmers. All contracts with private public service corporations were subject to cancellation at five years notice in order to supply the needs of the preference group. The board was required, however, to exhaust all efforts to make satisfactory contracts for the sale of power before constructing or purchasing transmission lines. The bill definitely stated that the project should be "considered primarily as for the benefit of the people of the section as a whole and particularly the domestic and rural consumers to whom the power can economically be made available, and accordingly that sale to and use by industry shall be a secondary purpose." The munic-

ipalities were prohibited from discriminating between customers of the same class and the price of power when resold by private corporations was to be fixed by contract.

At the very end of the bill were two very important sections which embodied the ideas of the President for complete development of the Tennessee Valley for the most beneficial use of water and land resources as follows:

> "Sec. 27. To aid further the proper use, conservation, and development of the natural resources of the Tennessee River Drainage Basin and of such adjoining territory as may be related to or materially affected by the developments consequent to this act, and to provide for the general welfare of the citizens of said areas, the President is hereby authorized . . . . to make such surveys of and general plans for said Tennessee Basin and adjoining territory as may be useful . . . in guiding and controlling the extent, sequence, and nature of development that may be equitably and economically advanced through the expenditure of public funds or through the guidance or control of public authority, all for the general purpose of fostering an orderly and proper physical, economic, and social development of said areas.
>
> Sec. 28. The President shall . . . . recommend to Congress such legislation as he deems proper to carry out the general purposes stated in said section and for the especial purpose of bringing about in said Tennessee Drainage Basin and adjoining territory . . . (1) the maximum amount of flood control; (2) the maximum development of the Tennessee River and its tributaries for navigation purposes; (3) the maximum generation of electric power consistent with flood control and navigation; (4) the proper use of marginal lands; (5) the proper method of reforestation of all lands in said drainage basin suitable for reforestation; (6) the most practical method of improving agricultural conditions in the valley of said drainage basin; and (7) the economic and social well-being of the people living in said river basin and all adjacent territory."

The bill passed the House in record time by an overwhelming vote. It is interesting to note that there was but one reference during the House debate to sections 27 and 28 of the bill. This came from a Republican representative who feared that it might lead the Government into dangerous paths. There was no consideration given to com-

prehensive development of water and land resources or to regional planning as indicated by the President. With regard to the provisions of the bill relating to general welfare, proper use of marginal land, proper method of reforestation, and the physical, economic and social development of the region, the House Committee reported that there had been no testimony offered before the committee, either in public hearings or in executive session, to show what was contemplated by that language.[88] The opposition continued to dwell on "government competition", "socialism", destruction of vested interests, inefficiency of government operation, and the undesirability of large Federal expenditures.

The Norris bill differed in that it provided for experimentation in the production of nitrogen rather than in commercial production of fertilizer on a large scale, and no restrictions or limitations were placed on the board in the purchase or construction of transmission lines. The Senate bill also provided for the five per cent payment to Alabama and Tennessee.[89] During the Senate debate most of the time was spent in discussing the various methods of producing nitrogen and fertilizer and the need for complete power by the board to build transmission lines. No explanation was given of the provisions for economic and social planning in the drainage basin and adjacent territory. There was very little opposition in the Senate to the bill. In the conference committee the House was victorious on the fertilizer provisions, and the Senate won out on the matter of transmission lines and the five per cent payment to the States. The report was submitted to the Senate and accepted immediately with no debate. The following day the House approved the report, and the bill was signed

88. H. Report 1005, 72d Cong., 1st sess.
89. S. J. Res. 15, 72d Cong., 1st sess.

by the President on May 19, 1933, thus bringing to a final close the long battle over the disposal of Muscle Shoals.[90]

The Activities of the Tennessee Valley Authority

The purpose of the Tennessee Valley Authority, as stated by Arthur E. Morgan, chairman of the board, is "to try to plan the use of natural resources and so to guide and encourage the energy and intelligence of the people that these resources shall change poverty, unemployment and relative aimlessness and hopelessness for young people into effective economic production and prosperity."[91] Although the power aspects of the T. V. A. program have received primary emphasis, power is not the principal purpose of the Authority. Fundamentally, the Valley Authority is an experiment in regional planning, replacing a haphazard, unplanned and unintegrated social and industrial organization by a planned social and economic system. Such a plan involves the conservation of land and water resources, a coordinated development of the river system for flood control, power and navigation; the prevention of soil erosion; the classification of land for all various uses; intensive agriculture on the best lands by the most efficient farming methods; direction of industrial development to meet the needs of the Valley and supplement farm incomes; reorganization of political administration; and provision for recreation.

No time was lost in creating the government corporation and assembling a staff to carry out the mandate of Congress. Dr. Arthur E. Morgan, formerly president of Antioch College and an authority on water control projects, was appointed chairman of the board. Dr.

90. 48 Stat. 58.
91. Morgan, Arthur E., "Bench-Marks in the Tennessee Valley", Survey Graphic, Vol. 23 (May, 1934), p. 236.

Harcourt A. Morgan, for many years the president of the State University of Tennessee, and David E. Lilienthal, prominent attorney who had been connected with the Wisconsin Public Service Commission, are the other members of the board. Dr. A. E. Morgan, in addition to the general duties of organization and administration as chairman of the board, is in charge of the river development program -- the construction of the dams, unified plan for the control and use of the waters of the region, and land utilization -- along with the more general fields of social and economic planning. Dr. H. A. Morgan is in charge of the fertilizer program and the problem of the balance of agriculture and industry in the region. Mr. Lilienthal has charge of the entire power program of the Authority -- the production and sale of power; construction of transmission lines; purchase of land; organization of farm cooperatives; and arrangements with the private power companies and municipalities for distribution of power -- and is, in addition, chief counsel for the Authority. Each member of the board has had outstanding records of achievement in their particular fields. The Authority's employment policy has been strictly on a merit basis and the organization has maintained complete independence of the political spoils system. For this independence, however, the Government agency has incurred the wrath of Congress.

Construction was commenced on the Cove Creek Dam, which has been given the very appropriate name of Norris, shortly after the passage of the act, and the dam was completed in 1936. The reservoir is now being filled and the power units will soon be in operation. In November, 1933, work began on the Joe Wheeler Dam (Dam No. 3) which project is also completed. The Pickwick Landing Dam, situated below

Wilson Dam, is nearing completion; and construction has been started on the Guntersville Dam and locks. In 1935 the act was amended to clarify and strengthen some of the provisions of the original law. Section 1 of this amendment definitely stated that the Authority shall have the power "to construct such dams and reservoirs, in the Tennessee River and its tributaries, as in conjunction with Wilson Dam, and Norris, Wheeler and Pickwick Landing Dams, now under construction, will provide a nine-foot channel and maintain a water supply for the same from Knoxville to its mouth", thereby eliminating any doubts as to the power of the Authority to plan for the comprehensive development of the river system.[92] Furthermore, the Authority was authorized to construct or acquire all facilities necessary to realize the maximum power potentialities at these dams and reservoirs.[93] Preliminary work has since been started on the Chickamauga project and it is scheduled for completion in 1939. The Hiawasse storage project (the Fowler Bend Dam) was authorized in 1936 and the preliminary plans are well under way.

Three additional dams on the main stream have been proposed by the Authority but have not, as yet, been authorized by Congress. These include the Gilbertsville Dam, which is twenty-three miles above the mouth of the river and will back water 184 miles to the Pickwick Landing Dam; the Watts Bar Dam and the Coulter Shoals Dam, both of which are located between Chattanooga and Knoxville. The Hales Bar Dam below Chattanooga, constructed by private interests

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92. 49 Stat. 1075.
93. This act also clarified the power of the Government agency to sell the surplus power, to construct transmission lines for that purpose, and to extend credit to the municipalities and non-profit organizations to acquire or construct the necessary facilities to use T. V. A. power.

many years ago, must be raised in order to fit into the plan for unified development. Another tributary storage dam is also proposed at the Fontana dam site on the Little Tennessee River.[94] This site is owned at present by the Aluminum Company of America. The completion of these dams[95] will provide a navigable channel of nine-foot draft for the entire 640 miles of the Tennessee River; improve navigation and river terminal conditions by reducing fluctuations at the dams and river terminals during flood seasons; provide flood control in the Valley; provide an adequate supply of water for domestic and manufacturing purposes and aid in pollution control; greatly improve the recreational possibilities in the region; and permit the development of a large amount of hydroelectric power. Two power units are to be installed immediately at the Wheeler, Norris and Pickwick Landing Dams. The Authority does not contemplate installation of power generating equipment at the other dams until there is a potential demand for such additional power.[96] If a demand for additional

94. See the report of the T. V. A. on The Unified Development of the Tennessee River System, March, 1936, for a complete description of these dams.
95. According to the program outlined by the Authority, with an annual appropriation of about $35,000,000 for dam construction, the ten dams will be completed by the end of 1943.
96. The Authority has estimated that the ultimate power production will be approximately as follows:

Project	Kilowatts
Coulter Shoals	54,000
Watts Bar	150,000
Chickamauga	160,000
Hales Bar	44,000
Guntersville	82,000
Wheeler	256,000
Wilson	445,000
Pickwick Landing	204,000
Gilbertsville	256,000
Total	1,651,000

water transportation on the tributaries or power should materialize, it can be provided by the construction of additional dams on the tributary streams. Assurance was made in the amendment to the act in 1935 that no structures should be constructed which would interfere with the unified development of the river by providing that any such structure must first have the approval of the Authority.[97]

In 1936 it was proposed in Congress that the Cumberland River be included in the jurisdiction of the Tennessee Valley Authority and developed in conjunction with the Tennessee River. The problems of the Cumberland are closely akin to those of the Tennessee Valley, and the two rivers could be advantageously operated together for navigation, flood control, and power development. In the plan for unified development of the Tennessee River system, the T. V. A. proposed a dam on the Ohio River at the mouth of the Cumberland, a dam across the Tennessee River near its mouth and a connecting channel between the Tennessee and Cumberland Rivers, so as to provide a little over 550 miles of continuous navigable water on a single level. The connecting channel between the two rivers would make the flood storage facilities of each stream available to all the others. After sufficient experience has been gained in the development of the Tennessee and the advantages of a comprehensive system of river utilization and control are fully realized, it is very likely that

97. "The unified development and regulation of the Tennessee River system requires that no dam, appurtenant works, or other obstruction, affecting navigation, flood control, or public lands or reservations shall be constructed, and thereafter operated or maintained across, along, or in the same river or any of its tributaries until plans for such construction, operation, and maintenance shall have been submitted to and approved by the Board, and the construction, commencement of construction, operation or maintenance of such structures without such approval is hereby prohibited." (49 Stat. 1079, sec. 11.)

the Cumberland will be included in the plan and developed along similar lines.

As far as the fertilizer aspects of the project are concerned, the Authority soon verified the oft-repeated statement of Senator Norris during the Muscle Shoals controversy that technological processes made commercial operation of nitrate plant No. 2 uneconomical. Moreover, upon investigation of agricultural conditions in the Valley and the adjacent territory, it was determined that the land was in far greater need of phosphatic plant foods than nitrogeneous fertilizers. The Government corporation has, accordingly, constructed a plant and is now engaged in experimentation in the production and use of such phosphatic fertilizers.[98] Nitrate plant No. 2 has been renovated, however, and is to be kept in stand-by condition for national defense purposes.

The Tennessee Valley Authority has experienced little difficulty in carrying out the mandate of Congress as to river regulation for navigation, flood control and power, or in the experimentation in fertilizer production. These have been primarily engineering problems. The social and economic difficulties of this projects have arisen in connection with labor policy, purchase of land, redistribution of the people living in the reservoir area, and relocation of highways, railroads, cemetaries, schools and churches. These problems have not, however, been insurmountable.

The most difficuot problems which the Authority will have to meet will come with its attempt to direct and plan the future social and economic development of the region. Inasmuch as the Authority is still in its infancy and is cautiously feeling its way about in

98. See the Annual Report of the T. V. A., 1935, pp. 18-22.

order to prevent the incurrance of widespread opposition, it is impossible at this time to venture any prediction as to the possible success of the Government agency in regional planning for the welfare of the people. To date, however, the activities of the Authority have been confined to demonstration projects, studies of various social and economic problems in the Valley, and investigations of the region.

In reforestation and soil erosion experiments, the Authority has collaborated with the Department of Agriculture. The Soil Conservation Service has selected badly eroded districts for demonstration purposes and has, with the aid of the T. V. A. staff, attempted to interest the farmers in an erosion control program. Areal maps have been made of a large part of the basin as a basis for effective land utilization plans. Part of the submarginal agricultural land in the hills has been purchased by the Government and the Forest Service is engaged in reforesting these areas.[99] Extensive surveys have been made of the forest areas in the region and the Forestry Division of the T. V. A. is developing management plans for the publicly owned lands. This program of land utilization, however, covers but a small part of the problem of preventing erosion, protecting watersheds, conserving water, and maintaining soil fertility. It will not, for example, solve the problem of private forest holdings which have become so run down that they are not furnishing even the minimum of local employment that was formerly provided.[100] Some

99. Editorial, "Reforestation", Science, Vol. 78, p. 500.
100. "The Valley's forest situation may be summed up in the statement that the forest is far from making the contribution that it should to the economic well-being and stability of the region." (Annual Report of the T. V. A., 1936, p. 62.)

of the farmers have appeared to be willing to cooperate with the Authority and the Soil Conservation Service and change their methods of crop cultivation. The Authority, however, has no power to impose the desirable system of land use. It can only appeal to reason, and it cannot be expected that reason will prevail when it conflicts with individual profit. One cannot be very optimistic, therefore, as to the program for land utilization or forest management until either the Federal agency or some appropriate state authorities are given adequate power to restrict land use and enforce proper methods of cultivation, crop diversification, and forest management.

The program for industrialization of the Valley presents similar problems. The Authority has been making surveys and conducting experiments in various industrial lines which will utilize the natural resources of the region. For example, the Authority has investigated the processing of primary kaolins, which are abundant in the Valley, and it is believed that they will soon be substituted for the important English kaolins in the manufacture of the better grades of ceramic whiteware. A pilot plant has been built at Norris Dam for this purpose. The establishment of such an industry would not incur the opposition of economic interests in this country; it would offer a market for power; and employment for the Valley population. The purpose of these studies is two-fold: first, to open up new markets for T. V. A. power, and, secondly, to supplement the cash incomes of the people in the Valley. To the present time, emphasis has been placed on the latter aspect of industrialization. The Authority has steadfastly refused to encourage the establishment of industries in the Valley with cheap power and the possibility of securing cheap labor. Such a policy would, of course, arouse the

antagonism of economic and political interests throughout the country, and it would not result in the social betterment of the Valley population.

Dr. Morgan has repeatedly stated that he conceives the future development of the area as that of a more or less self-sufficient economy on a cooperative basis. He is looking in the direction of scattered industries in small communities so that farmers may supplement agricultural with industrial incomes, rather than in large-scale industries concentrated near the power plants. Inasmuch as the resources of the Valley are not concentrated in any one place, the topography of the region lends itself more readily to small communities and industries and to the balance of agriculture and industry. Under a grant originally made to the state of Tennessee by the Federal Emergency Relief Administration, the Tennessee Valley Associated Cooperatives, Inc., was established for the development of rural cooperatives in the Valley and contiguous areas. The purpose of this agency is "to further cooperative marketing organizations in agriculture and to promote cooperative production for small rural industries. Such cooperative rural industries would make possible industrial decentralization and allow for a combination of industrial employment and part-time farming. An agricultural-industrial partnership of this kind was considered instrumental in raising the standard of living in the rural sections of the valley."[101] In the industrial field, however, this cooperative movement has made little progress. Considering the many restrictions -- economic, political and legal -- under which the T. V. A. is laboring, it cannot be ex-

101. Asch, Berta, "Changes in the TVA Program", Plan Age, Vol. 3, (March, 1937), p. 62.

pected that rapid strides will be made in developing the Valley.

In addition to such studies relating to industrialization of the Valley, the Authority has also conducted surveys of the history and status of farm tenancy in the Valley, the economic balance between markets and subsistence crops in several areas, and practices in government and finance in twenty-two cities and towns in Tennessee. This research program for the Valley has been given impetus by an allotment of Civil Works Administration funds, and the Authority has been assisted in such studies by the universities and other research agencies in the Tennessee Valley states. No immediate results are anticipated, however, for any change in the existing political or economic organization of the region will inevitably meet opposition from vested interests throughout the country.

Although Dr. Morgan, as chairman of the board, has emphasized the planning aspects of the T. V. A. program to provide for the social and economic welfare of the Valley population, and the coordinated development of the river system, popular attention has been concentrated on the power aspects of the Authority's activities. This direction of interest can be attributed in large measure to the activities of the private utilities, who have determined to fight the Government agency to the finish. T. V. A. power is now being sold to a number of municipalities and farm organizations at rates which are approximately fifty per cent lower than those of the private companies. As a result of this rate reduction, the demand for power has increased tremendously.[102] In order to meet this competi-

102. "Within twenty-two months after the new low rates were put into effect total residential consumption of electricity in Tupelo, Mississippi, increased 267%. In Athens, Alabama, after eighteen months, there was an increase of 272%, and in the same period in two county-wide associations in Alcorn

tion, the southern power companies have been forced to reduce their rates. For example, in Memphis, the day after the city applied for T. V. A. power, the Memphis Power and Light Company, a subsidiary of the Electric Bond and Share, offered to reduce its rates. By the end of 1933 the rates in Alabama had been reduced approximately twenty-three per cent. Needless to say, these private companies are not accepting this government competition with quiet acquiescence. The private coal interests have also joined with the utilities in opposing the T. V. A., considering the activity of the Government agency as a contemplated ruthless annihilation of existing coal markets. Both the power and coal industries are vigorously objecting to the extension of the policy of coordinated water development projects which include power generation.[103]

John C. Guild, Jr., president of the Tennessee Power Company, has expressed the attitude of the private interests by maintaining that the T. V. A. should be limited to supplying the power requirements of municipally owned and operated systems not now served by private companies; securing new industrial business; and promoting, organizing, and in many instances actually advancing the money and doing the construction work for rural electric cooperative associa-

(Cont'd) and Pontatoc Counties, Miss., increases of 220 and 293%, respectively. In New Albany, Miss., there was an increase of 114% in twelve months; in Pulaski, Tenn., an increase of 128% in eleven months; in Dayton, Tenn., an increase of 88% in ten months. Similar results have been reached in other communities using T. V. A. rates, allowances being made for the shorter period during which the reduced rates have been in effect." (Annual Report of the T. V. A., 1936, p. 39.)

103. "It is our belief that, if the taxpayers of this country once realize that this program will result in unbearable tax burdens; actually put men out of work, and destroy the values of mining property worth millions, they will organize themselves against such an unsound policy." (Congressional Digest, Vol. 13 (October, 1934), p. 243.)

tions.[104] If the power potentialities of the Tennessee River are to be fully developed, however, and if the advantages of cheap power production under a unified development of a river system are to be realized by the people living in the surrounding area, the market cannot be limited in such a manner. The Authority has, accordingly, adopted the policy that it cannot decline to take action solely upon the ground that to do so would injure a privately owned utility.[105]

The utilities have attacked the economic justification of T. V. A. rates, maintaining that they are possible only through government subsidies, including exemption from taxation, allocation of costs to navigation and flood control, use of the Government printing office and the franking privilege, inadequate depreciation reserve, and Public Works Administration grants to municipalities to purchase their distributing systems.[106] The friends of T. V. A. have met this attack with the countercharge that the rates of the Government agency can be considerably lower than those of the private utilities in as much as T. V. A. does not pay dividends on a large amount of watered stock, it does not pay exorbitant tribute to holding companies, it does not pay the high salaries and bonuses received by power company or holding company officials, and it does not spend money on propaganda and publicity or contribute to campaign funds to influence elections.[107]

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104. Guild, John C., Jr., "How the T. V. A. Really Hurts Private Utilities", Public Utility Fortnightly, Vol. 18 (July 2, 1936), p. 29.
105. "The most important considerations are the furthering of the public interest in making power available at the lowest rate consistent with sound financial policy, and the accomplishment of the social objectives which low-cost power makes possible". (Morgan, A. E., "Government Operation of Power Utilities", Congressional Digest, Vol. 13 (October, 1934), p. 242.
106. Guild, op. cit.

This controversy over T. V. A. power and the rates charged by the Government agency lies outside of the scope of this study. It is necessary to direct attention, however, to this opposition from the private industries for it may be effective in delaying the extension of Federal policy in the direction of coordinated river development. One important aspect in such a program is the generation of power in conjunction with river regulation, conservation of water, navigation, irrigation and flood control. Power development is inextricably bound up with these other aspects of water utilization and to omit it from the program of river control merely to satisfy the demands of a private industry would result in enormous waste of resources and government funds. It is inconceivable that public opinion would tolerate such a waste. This private opposition may result in a compromise as to the sale of such power, however, and prevent the realization of the full advantages of cheap power production in a unified program of river development. The present attitude of the private power companies precludes any hope of voluntary cooperation between the private and public agencies, and indicates the great difficulties which must be overcome before all power plants can be connected in an integrated grid system.

The private interests have not only used the old familiar arguments of unfair discrimination, violation of states' rights, and unconstitutionality against the T. V. A., but have also steadfastly refused to recognize that river regulation confers other utilities than power generation. This attitude is illustrated by their in-

107. Rankin, John E., "TVA Rates as a Yardstick", Current History, Vol. 42 (May, 1935), p. 124.

sistence that Boulder Dam power rates, which are simply the competitive market rates for power, are on a more logical cost basis than those of the T. V. A.[108] The Commonwealth and Southern Corporation, which is most directly affected by the T. V. A., has maintained that navigation and flood control should be eliminated from consideration in the T. V. A. program and power rates.[109] They have maintained that power and flood control are inconsistent; that the production of power requires retention of water in the reservoirs whereas flood control requires its release, and that "an attempt has been made in the Tennessee Valley to reconcile these inconsistencies by building the dams somewhat higher than normal."[110]

It is quite true that a single dam and reservoir cannot be used for the purpose of flood control, and, at the same time, be a profitable power investment for a private concern. When a series of dams are operated by a central agency, however, the situation is entirely different. By allowing surcharge for flood control, and connecting all the power plants by transmission lines, this series of dams can be effectively operated to meet both purposes. Such a unified multiple-purpose system of river control and utilization cannot,

108. Owen, Ely, "Financial News and Comment", Public Utility Fortnightly, Vol. 18, p. 37.

109. "The feeble nature of the claim that the T.V.A. was created for navigation is indicated by the fact that there is no place in the Tennessee Valley that is not now adequately served by hard-surfaced roads and railroads." (Annual Report of the Commonwealth and Southern Corporation for 1935.)
"Anyone familiar with the Tennessee Valley might well question the necessity of developing navigation facilities in an area whose transportation needs are already adequately served by hard-surfaced roads and railroads, which latter, if our information is correct, are presently none too prosperous." (Analysis of the Annual Report of the T.V.A., prepared by the Commonwealth and Southern Corporation, February 17, 1937, p. 4.)

110. Ibid., p. 4.

however, be compared with the production of power by the private industry; and the generating costs at the Government dams cannot serve as a guide, or a "yardstick", for regulatory purposes. The yardstick theory has so many obvious fallacies that, although it may have certain political advantages at the present time, it may prove to be a boomerang and ultimately serve to discredit the Government experiment in unified development of the river system.

The private interests have naturally minimized the benefits to navigation, flood control, recreation and sanitation, which may result from river regulation, in order to force the Government agency to allot the entire investment of the undertaking to power. In the amendment to the act in 1935, Congress requested the board to make a thorough investigation as to the value of Dam No. 2 and the steam plant and the costs of the dams constructed by the Authority, "for the purpose of ascertaining how much of the value or the costs of said properties shall be allocated and charged up to (1) flood control, (2) navigation, (3) fertilizer, (4) national defense, and (5) the development of power. This report has not as yet been made available, but it is probably that the Authority will allot each item some share of the total investment, thereby reducing the capital investment for power far below that held by the power companies. It must be fully realized that the allocation of the greater part of the costs incurred for river regulation and development must be arbitrary for they are incurred jointly. The allocation of such costs will depend in large measure on public opinion as to the importance of each aspect of water utilization or control to the public welfare.[111]

111. For a discussion of this problem of cost allocation see the article by Horace M. Gray, "The Allocation of Joint Costs in Multiple Purpose Hydro-Electric Projects", American Economic Review, Vol. 25 (June, 1935), p. 224.

In 1934 the preferred stockholders of the Alabama Power Company brought suit to annul a contract made by the company with the T. V. A. for sale of transmission lines from Wilson Dam and real property adjacent to the Wheeler Dam site, on the ground that the contract was injurious to the corporate interests and also invalid because it was beyond the constitutional power of the Federal Government. The plaintiffs asked for a general determination of the constitutionality of the T. V. A. The Supreme Court decided the case in favor of the Government, but limited its decision to the single issue of the transmission lines for the distribution of power from Wilson Dam.[112] The right of the Government to build this dam for national defense purposes was undeniable. The sale of surplus power from the dam was, therefore, declared valid under Sec. 3 of Article IV of the Constitution which grants Congress the power to dispose of and make all needful rules and regulations respecting Government property. The decision, which was written by Chief Justice Hughes, definitely stated, however, that no opinion was expressed as to the constitutional right of the Government to acquire or operate local or urban distribution systems, to the status of any other dam or power development in the Tennessee, whether connected with or apart from the Wilson Dam, or as to the validity of the Tennessee Valley Authority Act. The Chief Justice did indicate, however, that the power of Congress was wide under its authority to regulate and improve water-

112. Justices Brandeis, Stone, Cardoza and Roberts announced in an opinion written by Justice Brandeis that they did not disagree with the conclusions of Chief Justice Hughes as to the issues of constitutionality, but they did deny that the plaintiffs could properly bring this suit. Justice McReynolds wrote a dissenting opinion, denying that the Constitution permitted Congress to authorize the activities of the Tennessee Valley Authority embraced in the contract at issue. Ashwander v. T. V. A., 297 U. S. 288 (1936).

ways for the purposes of navigation. Whether or not these powers are sufficient to uphold the complete T. V. A. program will remain for later cases to decide.

In view of the many restrictions and limitations which have been imposed on the policy of the Authority in developing the Tennessee Valley, one cannot expect outstanding results in the direction of economic and social planning -- such as the integration of industry and agriculture to increase the standard of living of the Valley inhabitants; the adoption of forest management plans by private owners which will result in sustained yields and increase of employment; the acceptance of a land use program by private landowners which will prevent soil depletion and erosion; or a change in local governmental structure and practices. An appeal to reason cannot achieve such results. Irrespective of these admitted limitations, the T. V. A. is, nevertheless, the widest experiment in planning ever attempted in this country. For the first time in the history of national policy with respect to water resources, an entire river system is to be developed in accordance with a unified plan, considering all aspects of water utilization. The results achieved by this Government agency in the operation of a series of dams and reservoirs in the combined interests of navigation, flood control and hydroelectric power, and in the distribution of this power, will exert a powerful influence on future national policy with respect to water resources and power. Inasmuch as power is the chief controversial aspect of coordinated river development, the success of the T. V. A. in distributing cheap power and demonstrating the enormous demand for power at low prices, will be very instrumental in the adoption of similar projects for other rivers in this country. The extent to which public interest

has been aroused in the possibilities of coordinated river development will be shown in the following chapter, which considers those projects which have been partially adopted or have been proposed for Federal consideration.

Summary.

The creation of the Tennessee Valley Authority and the present program for the unified development of the Tennessee River and regional planning for the betterment of economic and social conditions of the people living in the Valley grew out of the problem of disposing of the Government properties at Muscle Shoals -- the Wilson Dam and power plant, the nitrate plants, and the steam power plant -- which were constructed for national defense purposes during the War. The variation of stream flow of the River was so great that the Wilson Dam plant was of little value, and navigation during low water was impossible. Senator Norris, who is the outstanding figure in the long battle over Muscle Shoals, soon realized the need for coordinated development of the river for power, navigation and flood control, and led the fight for Government operation and ownership of the project. The general opposition to Government operation, which was greatly stimulated by the power and fertilizer industries, delayed legislation for many years. On two occasions a compromise was effected in Congress but was vetoed, first by President Coolidge and then by President Hoover, because of the Government operation provisions.

With the inaugeration of President Roosevelt and a shift in control in Congress, it was possible to secure legislation which provided for complete development of the Tennessee River. President Roosevelt, who has long been an advocate of cheap power production

wherever possible under Governmental operation and an ardent conservationist, realized the full implications of the proper development of the river system and accordingly recommended the provisions for economic and social planning which are embodied in the act. In order to realize the maximum benefits from the water resources in the Valley, the plan of utilization must include not only a series of dams on the river system for storage, navigation and power, but also a water conservation program on the land throughout the drainage basin and the prevention of soil erosion. The development of the river, therefore, necessarily involves the governmental agency in a consideration of all aspects of the economic and social development of the region. Planning for the use of land necessitates consideration of such economic factors as markets for agricultural goods, farm incomes, tenancy, the size of farms, and farm indebtedness and resettlement of farmers who are now using land unsuited for crop cultivation. Determination of power policy requires a consideration of industrial development in the region, the extent to which it should be stimulated and the type of industries which will be most conducive to the welfare of the people living in the region. The project for river development, therefore, which started with a Government dam and power project on the Tennessee has led to regional planning for the drainage basin.

CHAPTER VIII.

PROPOSED PROJECTS FOR THE COMPREHENSIVE DEVELOPMENT OF RIVER SYSTEMS

Development of the Columbia River

The Pacific Northwest region, including the states of Oregon, Washington, Idaho and Montana, represent thirteen per cent of the entire area of the United States but have only three per cent of the total population. The economic activities of the region are devoted primarily to the production and processing of raw materials, which include principally forestry products, grain, fruits, minerals and fish. Manufacturing plays a minor role. The region possesses great possibilities, however, in the large areas of fertile irrigable land, an abundance of water for that purpose in the Columbia River system, valuable water power sites at which a great deal of electrical energy can be generated, and a variety of mineral resources as a basis of industrial development.

The Columbia River is the most important single natural asset in the region and will be a predominant factor in the future development of the region. The lower section of the river has been a Federal project for many years and is open to ocean-going vessels to Portland. The upper Columbia, above the mouth of the Snake River, drains a region which has a very low rainfall but very fertile soil. There are many valuable power sites on the river, representing forty-two per cent of all the undeveloped hydroelectric power in the country. Because of the unequal seasonal and geographic distribution of the runoff, however, extensive storage is required if the maximum utilization of water is to be realized.

The possibility of irrigating and reclaiming many thousands of acres by diverting the waters of the Columbia River or its tributaries has been a source of speculation and investigation for many years. The Columbia is second in size in the United States and is a fast-moving, clear stream. The river rises in Canada in the Columbia Lake, flows through the State of Washington and then turns westward to form the boundary line between Washington and Oregon. The land susceptible of irrigation, known as the Columbia Basin, lies in the Big Bend country, above the mouth of the Snake River. It is situated in the south central part of the state of Washington, almost touching the Oregon line on the south, and within fifty miles of the Idaho state line on the east. It is almost equidistant from Portland, Seattle and Spokane. The soil and climate of this basin is very similar to that of the Yakima and Wenatchee districts, where farming by irrigation has been very successful. The soil is a silt loam which is very productive, but very susceptible to wind erosion under dry-farming methods. For the most part, the land is a gently rolling plain crossed at intervals by coulees, or natural drainage ditches.

There is approximately three million acres in the basin, of which the soil experts have ascertained that somewhat less than two million is suitable for cultivation by irrigation. 410,000 acres in the eastern section of the basin are irrigated through the Quincy Valley Irrigation District, and there are a number of farms throughout the region irrigated by individual, unorganized systems.[1] Dry

1. The irrigated areas within the basin have successfully cultivated wheat, potatoes, corn, alfalfa, sugar beets, grass, seeds and livestock. The productiveness of the area is indicated by the fact that wheat will produce sixty bushels per acre, and has gone as high as eighty. Average yields of staple crops in this area are from two to three times as high as the general average for the United States. The soil and climate are adapted particularly to wheat and fruit but would probably also be used for general diversified farming.

farming was attempted in a large part of this area but proved a failure due to lack of sufficient rainfall, which varies from six to ten inches annually. Approximately ninety per cent of the land in the basin is privately owned; the remainder is Government and State land. Originally alternate sections of the basin were held by the Northern Pacific Railroad Company. This land was sold, the Government land was taken up by homesteaders and the region experienced a brief boom. Schools were built, improvements were made, and good buildings were constructed. Failure was, however, inevitable. The average rainfall could not support even dry farming and when the moisture of the soil was exhausted the region was bankrupt. The settlers left the country and the title to their land was held in large part by their creditors.[2]

The supply of water from the Columbia River or its tributaries is fully adequate to irrigate this entire district. There are two general methods of accomplishing this purpose. The water may be pumped from the Columbia River directly, using the Grand Coulee which lies above the river as a storage reservoir for the irrigation project; or it may be diverted by gravity from the tributaries, using the numerous lakes at the headwaters for storage purposes. There are many refinements and alternatives of each general method, however, which give a variety of cost estimates for the undertaking. Moreover, the importance of hydroelectric power in these different schemes ranges from a very negligible to an exceedingly important aspect of the project.

2. Neuberger, Richard L., "The Biggest Thing on Earth", Harpers Magazine, February, 1937, p. 247.

The Grand Coulee was the bed of the river during the Ice Age when the main channel was blocked.[3] It lies 612 feet above the Columbia River and thirty miles north of the Columbia Basin. To irrigate the basin from the Grand Coulee necessitates pumping the water several hundred feet from the river, depending on the height of the dam. It would, of course, be very expensive, but a great deal of power would be developed as a by-product of the irrigation project. On the other hand, the water could be stored in the numerous lakes on the headwaters, such as Flathead Lake, Lake Pend D'Oreille, Lake Coeur d'Alene, and Priest Lake, and diverted to the basin by gravity by means of a long canal and tunnels. A small amount of power would be available from this method on the canals. These lakes, however, are located in the states of Idaho and Montana, which brings up complicated interstate problems as to the allocation and use of the water of the Columbia and its tributaries. By repumping from the main canal in both of these general methods, an additional acreage can be irrigated. The enormity of the undertaking and the variety of means of irrigation necessitated many investigations and various proposals as to the proper method from an engineering and economic viewpoint.

Investigations of the project and agitation for Federal activity.

The possibilities of irrigating this area in eastern Washington received consideration and investigation by the United States Reclamation Service as early as 1904, at which time surveys were being made in the arid States to choose the reclamation projects which should receive the immediate attention of the Service. Surveys

3. See Neuberger, op. cit., for an excellent description of the Grand Coulee.

were made for canals using the Columbia, Spokane, and Palouse Rivers as sources of water supply. The Priest Rapids area was investigated in 1905. Again in 1914 and 1915 an investigation and report was made on a proposed project north and west of Pasco, Washington, using the Palouse River as a source of water supply. This work was done under a cooperative agreement between the State of Washington and the United States Reclamation Service. These reports all indicated the desirability of such a reclamation project but recommended that any definite action be deferred until more thorough studies were made and economic conditions warranted the undertaking.

In 1919 the State of Washington appointed a commission to make another survey, at a cost of $100,000.[4] This commission reported that there was an abundance of water for irrigation purposes; that there were no adverse engineering features; that the irrigable land was of excellent quality and would require little expense to prepare it for irrigation; and that the gravity method was preferable, developing secondary power on the canals purely as a by-product. The report concluded that the project was economically feasible and desirable, but that the undertaking was so large that only the Federal Government could build it.[5] During 1921 the State of Washington further investigated the various dam sites on the river and prepared estimates of the costs of developing power, pumping water for irrigation and building transmission lines at the Foster Creek and Grand Coulee sites. Before submitting a definite proposal to Congress,

4. This commission investigated a number of plans for the project water supply, including several alternatives of a gravity supply, diverting the water from Clark Fork, a partial water supply from the Wenatchee River, and a plan for pumping water at the Grand Coulee site with a dam in the Columbia River 180 feet in height above low water.
5. The report of this commission was reviewed by the Reclamation eigineers who suggested some changes with regard to estimated costs and further investigation.

however, it was deemed advisable to have the survey reviewed and a report made by an engineer of great repute, an outsider who would not have any bias on the project. For this purpose General George W. Goethals, the builder of the Panama Canal, was employed to survey and report on the project. He reported in 1921 as follows:

1) The gravity method is preferable to the pumping method.

2) The project is feasible, not alone from the standpoint of construction, but from that of economics as well.

3) The Columbia Basin project is as much a national one as were the Panama Canal and the Alaska Railway, and will when completed, add much more to the national wealth than either of the others mentioned.

4) The project is a national one and the Government should bear the interest charges.

This report showed considerably lower unit costs than that of the Washington Columbia Basin Commission. With this assurance, the State approached the Federal Government and secured an appropriation in 1923 of $100,000 for an investigation, to be made by the Department of the Interior.[6] This survey was made by the engineers of the Reclamation Service and covered a period of two years. It is known as the Gault Report. The Department of Agriculture also assisted in the investigation to analyze and classify the various kinds of soils found in the basin. The project was again declared feasible, the gravity plan was recommended as favorable to the pumping plan, and the recommendation was made that no power projects should be initiated which would establish rights which would become prior to

6. 42 Stat. 1540.

the irrigation requirements of the project.[7]

A board of engineers of the Reclamation Service reviewed the Gault report in 1924. The conclusions of this report are summarized by the Bureau as follows:

> "The board found that the construction cost of irrigation under the pumping plan of lowest cost would be $246.58 per acre, as against $231.40 per acre under the gravity plan of lowest cost. The board in arriving at the cost of $246.58 per acre for the pumping project considered that the power market in the territory was so fully covered by private and municipal developments that no net income could be relied upon from the sale of power to offset the greater cost of both construction and operation of the pumping cost over the gravity plan. It was judged that the entire cost of the dam in the Columbia River, that part of the power plant required for irrigation pumping, the pumping plants and transmission lines necessary for repumping on the project, amounting to 47.7% of the total cost, would have to be borne by the irrigation project in addition to the construction items for the distribution of water and the drainage of the lands."[8]

All of these surveys were concerned solely with the engineering and economic aspects of securing water to be used for irrigating the land and the quality of the soil in the basin. Due to the many difficulties experienced by the Reclamation Service in development and settlement of reclamation projects, and in the collection of the water-right charges, the engineers for the Service and the Secretary of the Interior emphasized the fact, in their reports and at the committee hearings, that in addition to engineering studies and soil surveys, attention should be given to the difficult problems of land

7. This report considered four alternatives of each of the two general methods of irrigating the basin. The gravity plan was investigated with high ahd low lines, each with and without repumping. The pumping plan, proposing a dam in the Columbia River at the Grand Coulee site, 280 feet in height above low water, was investigated with and without storage, and with and without repumping.
8. Report on the Columbia River, H. Doc. 103, 73d Cong., 1st sess., p. 487.

settlement and farm development.[9] Accordingly, the Secretary of the Interior appointed a Columbia Basin Commission, consisting of Elwood Mead, Commissioner of the Bureau of Reclamation, and John H. Edwards, Solicitor of the Department of the Interior, to review the Gault report and consider the problems of settlement and development.[10] The board appointed by this Commission to consider the problems of the proposed project believed that the economic conditions so definitely favored the gravity system that it did not make any analysis of the power problem on the Columbia River. Attention was confined to estimates and analyses of the various plans of supplying water to the Columbia Basin by diverting it from the Clark Fork at Albany Falls.[11] The board recommended that the State should assume responsibility for collecting payments from the settlers and should also bear its proper share of the losses, if any, incidental to the development of the project. The Commission reviewed the report of the engineering board and concluded that local and national interests would not justify the construction of the project at that time, and that the Bureau of Reclamation did not have either the information or the experience necessary to formulate a development program as costly

9. The Gault report specifically stated that no consideration had been given the following aspects of the proposed project: (a) restriction of speculation in land; (b) organization of the irrigation district; (c) means of financing the project; (d) terms of repayment; (e) limitation of land ownership; (f) probable rate of settlement; (g) market for and value of the power produced; (h) feasibility from the financial viewpoint; (i) demand for irrigated land; (j) capital required by the farmer.
10. Six men were appointed by this Commission to form a reviewing board who came from all parts of the United States and were familiar with the economic and agricultural aspects of reclamation as well as the engineering problems of irrigation. The report of this board is published with the Gault report.
11. The cost estimate of this board was $158 per acre, assuming that 1,224,000 acres would be irrigated.

and complex as that outlined for the Columbia Basin.

In 1926 an additional $25,000 was appropriated to make further studies of soil and economic conditions.[12] With regard to settlement problems, the report recommended that all lands in private ownership be purchased by the Government, as essential to the prevention of speculation and the prompt settlement and cultivation of the land. An investigation of the power sites of the upper Columbia was made by the Federal Power Commission in 1923.[13] The commission concluded that the Columbia Basin irrigation project was the most important single item to be considered in the uses to be made of the Columbia River water above the mouth of the Snake River, and that information upon which to base a final decision between a gravity and a pumped supply for the project was not complete and should be completed immediately so that the Power Commission could consider applications for power sites on the river.[14] From 1926 to 1930, studies of various water supply and power development problems relating to the Columbia Basin project were made by the United States Geological Survey at the request of and collaborating with the State of Washington.[15]

12. The survey was conducted by B. E. Hayden of the Bureau of Reclamation, and Professor George Severence, of the State College of Washington, and was submitted to the Bureau in 1928.
13. The committee appointed by the Commission to make the survey included J. S. Cavanaugh of the Corps of Engineers, D. C. Henny of the Reclamation Service, F. F. Henshaw of the United States Geological Survey, C. S. Heidel, State engineer of Montana, W. G. Swendsen, commissioner of the Department of Reclamation of Idaho, and Marvin Chase, supervisor of hydraulics of the State of Washington.
14. Report to the Federal Power Commission on the Uses of the Upper Columbia River, 1923.
15. The more important of these are as follows: Power Possibilities of Priest River, Idaho, 1926; Preliminary Report of the Columbia Basin Project, Water Power Analysis, 1926; Storage Regulation in Flathead Basin for Power and its Effect on the Columbia Basin Project, 1926; A study of the market for products of the proposed project by Chester C. Hampson for the

As long as the gravity plan of irrigating the basin was under consideration, the states of Idaho and Montana had to be considered, for the storage lakes were located in these states. For over ten years the states in the Columbia River Basin attempted to arrive at some agreement on the allocation of the waters of the river, but met with even less success than did the Colorado River basin states. A Federal act was passed in 1925 to give the states of Washington, Oregon, Idaho and Montana the power to execute an interstate compact by January 1, 1927. This time limit was extended by later acts.[16] Two Federal representatives, from the Departments of War and Interior, were directed to meet with the interstate commission. It was soon found, however, that any agreement on the allocation or use of the water of the Columbia River was highly improbable because of the importance of the water for future irrigation and power purposes, and the fear that Washington would appropriate an undue proportion of the water or use it in such a manner as to destroy other power sites. In 1930 the Secretary of the Interior reported that the efforts of the commission had been unsuccessful and that its activities had been practically suspended. Further acts were passed to keep the way legally open for an agreement between the States, but interest in the compact subsided when the Federal Government decided to adopt the Grand Coulee project for it does not interfere with the use of water in other states.

In order to facilitate and encourage the adoption of the project by the Federal Government, the state of Washington passed a reclama-

(Cont'd) Department of Conservation and Development of the State of Washington, 1927; and the Albany Falls Power Project in Connection with the Columbia Basin Irrigation Project, 1930.

16. 44 Stat. 247, 44 Stat. 1403, 47 Stat. 381.

tion act in 1927 providing for the organization of irrigation districts embracing all counties in which any of the land to be irrigated is located. This district is empowered by the law to levy taxes on all property within its limits. Proponents of the irrigation project anticipated that a portion of the cost of the project would be borne by general taxation and that the per acre cost to the settlers would be considerably reduced.

In 1928 identical bills were introduced into the House and the Senate by representatives from the state of Washington for the adoption of the Columbia Basin Irrigation project by the Federal Government.[17] Hearings were held on the bill by the Committees on Irrigation and Reclamation in both Houses. Among the witnesses who recommended adoption of the project were representatives of the Columbia Basin Irrigation League,[18] officials of the four transcontinental railroads serving the territory to be included in the project,[19] members of the faculty of the Washington State College, the congressional representatives from Washington, and the American Federation of Labor. The arguments offered by the proponents of the bill for immediate adoption of the project were briefly as follows:

17. The provisions of the bills were very general, leaving all details as to the choice of the engineering methods of irrigation and the settlement and development of the project to the Secretary of the Interior. (H. R. 7029 and S. 1462, 70th Cong., 1st sess.)
18. The Columbia Basin Irrigation League was formed in 1920, a voluntary organization of citizens of Montana, Idaho, Oregon and Washington, representing the business interests in these states. The guiding spirit of the League, however, was the city of Spokane which expected a great increase in business activity with the adoption of the project. From 1922 to 1928 this organization spent almost $100,000 alone for investigations of the project. It was active in stirring up public interest in the project and keeping it before Congress for consideration.
19. Namely, the Union Pacific, the Chicago, Milwaukee and St. Paul, the Great Northern and the Northern Pacific.

1) Future need for agricultural land.

The area of the Columbia Basin is one-half per cent of the total lands in the United States under cultivation, and its complete development was estimated to add approximately one per cent to the present agricultural production. It will take ten years, however, to construct the necessary works to bring the water to the land, and another five or ten years will be required to settle the first unit of 400,000 acres. On the other hand, the population of the United States has been increasing at the rate of two million per annum. By the time the lands within the project are under cultivation, therefore, the increased demand for food will readily absorb the products of the Basin. The advocates of the project insisted that its immediate adoption would have no effect on the present agricultural distress, and that the lands would be needed to supply the food requirements of the Nation by the time of its complete development. The American Federation of Labor emphasized the need for homes and the opportunity for supporting families at a decent standard of living. There was no appreciation, however, at this time of the possible role of the Columbia Basin project in a national land policy, and the relation of this vast area of rich soil to the maladjustments and misuse of lands in various parts of the country. The project was considered solely on an economic basis, as an individual enterprise which must be self-liquidating and justifiable as a purely economic undertaking. Furthermore, inasmuch as Federal funds would be spent for the project, it must not conflict with any vested interest, so to speak, in agricultural markets.

2) A new market for manufactured goods.

Studies of the purchases of the western irrigation districts revealed that many thousands of carloads of manufactured goods were shipped into these districts annually, and that these had their origin in practically every State in the Union. A survey which was made of the shipments received in Yakima Valley during 1927 revealed that the district had purchased goods from outside the state which totalled over thirty million dollars.[20] A national interest was, accordingly, established for the project in that industries throughout the country would be beneficially affected. The proponents of the bill estimated that the Columbia Basin project, when completely settled and fully developed, would purchase $180,000,000 of goods annually from other states. Particular emphasis was placed on the advantages to be realized by Eastern manufacturers although a large part of these purchases would unquestionably come from California and the Middle West.

3) Increase in wealth.

The increase in local and national wealth which would result from the construction of the project was advanced as an argument in favor of the bill. The representatives from the state of Washington estimated an increase of $600,000,000 in realty values on which state and county taxes would be levied.[21] This increase in wealth

20, See the hearings on The Columbia Basin Project, S. 1462, before the Committee on Irrigation and Reclamation, Senate, 70th Cong., 1st sess.

21. In regard to this increase in taxable wealth, a representative of the Seattle Chamber of Commerce remarked at the hearings that "inasmuch as we have been deprived of collecting taxes on property which the Government has taken from us, when it really should be a trustee for the State, I think we should be entitled to put that property on our tax rolls." (Ibid., p. 79).

was deemed a total national gain, in which the Federal Government would share by an increase in income tax collections.

4) Development of the Pacific Northwest.

In addition to the immediate advantages to labor and industry from large Federal expenditures and the ultimate increase of the wealth of the region by the increase in population and settlement of the Columbia Basin, the business interests of the state of Washington anticipated a brilliant and prosperous future for the Pacific Northwest with the adoption of the project by the Federal Government. The increase in population, the growth of towns, and the existence of valuable raw materials and power resources would attract capital and foster the industrial development of the region. Such industrial development would, in turn, lead to the growth of the large cities in the region and a great increase of trade with the Far East. There is no question but that the proponents of the bill were primarily the cities and business interests in Washington and Oregon who would be immediately and directly benefited by the construction of the project.

The Quincy Valley Irrigation district and the unorganized landowners in the Basin, who were irrigating their land individually or attempting dry farming, formed the Columbia Basin Land Owners' Association to advocate the adoption of the project. This organization strongly urged, however, that the pumping method be adopted rather than the gravity method, for the simple reason that the Quincy Valley was not included in the plans for the gravity system as it was too remote from the main canal. In favor of the pumping method, this organization contended that a larger area could be irrigated; that the secondary power would be used for pumping purposes; that

the increasing market for the primary power from the dam would consistently lower the costs of water to the farmers; that all interstate difficulties would be avoided by this method; and that the gravity method of diverting water at Albany Falls would destroy the value of other power sites below the Falls. The Association accordingly recommended to the Senate Committee that inasmuch "as the lands represented by our organization are admittedly in greatest need of irrigation, and as they can best be served by the pumping plan, we respectfully request that the Federal Government make further detailed investigations and studies of this plan, taking into account the effect of revenues derived from the sale of commercial power to possible users with particular reference to existing power systems within transmission distance."[22]

The association proposed a 220 foot dam at the Grand Coulee site, the highest dam possible without interfering with the next large site upstream on the Columbia at Kettle Falls. Other heights of dams up to 600 feet were discussed at the hearings, to eliminate the extent of the lift to the Grand Coulee Lake. Although the cost of pumping under this method was high, the use of Grand Coulee Lake as a reservoir necessitated but ten miles of construction work to reach the project, whereas the gravity system required a series of canals and tunnels 134 miles in length to reach the Basin. The Columbia Basin Irrigation League, however, definitely objected to any consideration of the pumping plan.[23] Inasmuch as the League was composed primarily of the business interests in the region, it is to be expected that

22. Ibid., p. 104.
23. The reasons for their objections are given in the Senate hearings on S. 1462, pp. 142-3.

it would oppose any project which would conflict with the interests of the private power companies as long as an alternative method of securing a water supply existed.

Although there is less concrete evidence of power opposition in regard to the Columbia Basin project, it is reasonable to assume that there was opposition and propaganda by the power group to prevent power development by the Federal Government in this case just as there was in regard to the Boulder Dam and Muscle Shoals projects. Without making specific reference to the Columbia Basin project, the propaganda of the utility industry to educate public opinion to the virtues of private enterprise and the necessity of keeping the Government out of their business was directed toward all such Federal projects. The attitude of the industry toward the project is expressed in the following quotation from a speech made by Mr. Alton Jones before the joint committee of utility organizations in 1927:

> "The job that the industry has done has been so splendid that it is with fear and trembling that we see some indications of the Government stepping into our business. There are many other lines of endeavor that they can afford to get into. There are many things about our business that require special training and special treatment, and the Government, as you know, is not in a position to give them special treatment.
>
> The things that have been brought to our attention in recent months that are bound to impress us, if we are thoughtful at all, are such things as the Boulder Canyon bill, Muscle Shoals, St. Lawrence and Columbia River, all part and parcel of the same general trend of thought -- government in business, and not only government in business, but government in our business . . . . Those of us who think we know something of the economics know it is unsound, there is no need for it."[24]

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24. Utility Corporations, Sen. Doc. 92, 70th Cong., 1st sess., Parts 10-16 (Exhibits), p. 131.

The State of Idaho objected to the indefinite form of the bill and to the possible effects of the proposed gravity system on the property and potential power developments in the State. It was contended by representatives of the State that the raising of the lake levels to meet the storage requirements of the Basin, property values upon which taxes are being paid to local county and State governments would be destroyed, though in their place would be created values in an adjacent State. By building a diversion dam at Albany Falls for the main canal to the Columbia Basin, the potential power at this site would be lost to Idaho. The position of Idaho with regard to the Columbia project (under the gravity plan of supplying water to the Basin) is very similar to that of Arizona in the Boulder Dam controversy. The conclusions drawn by W. G. Swendsen, commissioner of reclamation for Idaho, indicate the nature of the demands of the State before consenting to an interstate compact, allowing the use of its lakes for storage reservoirs for the irrigation project:

1) The use of Priest Lake as a storage reservoir for the Columbia Basin project would be decidedly detrimental to Idaho and should not be permitted. No storage should be permitted in Priest Lake which would cause a greater annual fluctuation in the lake surface than now exists or which would injure the lake or surrounding territory.

2) The use of Coeur d'Alene Lake for a storage reservoir as contemplated by Columbia Basin project interests would be very detrimental to Idaho and should not be permitted. Consideration of existing data leads to the conclusion that this lake is more beneficial under present uses than it would be if dedicated to irriga-

tion storage for Columbia Basin project.

3) Any compact that may be adopted should reserve to Idaho the primary right to the use of such water from any and all of the lakes or streams involved as may, in the judgment of the State, be required to satisfy fully its needs for irrigation and other consuming uses, such primary rights to be independent of the time when beneficial use begins.

4) If the Columbia Basin gravity project is built, potential power in Idaho would be reduced and any compact that may be adopted should provide an adequate compensation to the State for such loss.

5) A considerable amount of private, corporate, State and other property would be involved either in purchase or damages, or both, and as a condition to the approving of any compact Idaho should require an equitable settlement of any claims arising from these conditions or transactions.

6) If the Columbia Basin project is built as contemplated, taxable wealth in Idaho would be decreased and an adequate provision should be made to compensate in some manner the State and its political subdivisions for anticipated losses caused by such building.[25]

It was these problems which prevented the States from reaching any agreement as to the appropriation of water for use in the state of Washington. The concensus of opinion at the hearings before the House Committee was that Idaho had sovereignty over the use of water within the state and that an interstate compact would be necessary before any water could be stored or diversions made in Idaho.

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25. Hearings on The Columbia Basin, H. R. 7029, before the House Committee on Irrigation and Reclamation, 70th Cong., 1st sess., p. 32.

The opposition of the Landholders' Association and the State of Idaho indicated the need for further study of the pumping method as compared with the gravity method and of the interstate problems involved in the use of the water and the lakes for storage purposes. In addition, the hearings revealed that there was disagreement as to the classification of soils within the region and the total irrigable area, and that inadequate consideration had been given to settlement and development problems. When the bill was referred to the Secretary of the Interior, Hubert Work, he replied that he could not recommend favorable consideration of the bill in its present form, but would recommend a reasonable appropriation to further and complete the necessary investigations.[26]

The Senate committee reported the bill favorably without amendment.[27] The House committee recommended passage of the bill, but added the definite provision that no appropriation should be made for construction of the gravity plan until a compact had been effected by the states to determine the allocation and use of the water of the river and its tributaries.[28] Such a provision would unquestionably have blocked immediate construction of the project. The bill was not received with any enthusiasm in the Senate, however, because of the unfavorable report of the Secretary of the Interior,

26. "The importance of this project to the Nation would make advisable a complete investigation of feasibility and cost, extending over several years. This should include the extent of the irrigable area with a classification of soils of that area, measurements of water supply and determination of the costs of works for storage and distribution, working out plans for settlement and farm development. All this information would be necessary in order to make a final and safe determination of the feasibility as a prerequisite to recommending authorization of the project." (The Columbia Basin Project, H. Report 872, 70th Cong., 1st sess., p. 7.)
27. Sen. Report 345, 70th Cong., 1st sess.
28. H. Report 872, 70th Cong., 1st sess.

the apparent lack of information as to the proper engineering method, and the general opposition to reclamation projects.[29]

Under the mandate of Congress in the rivers and harbors act of 1927 to survey all navigable rivers in the United States, a complete and comprehensive study was made of the Columbia River for the first time for coordinated development of the river. Four years were spent on this investigation and the future development of the river was outlined for navigation, flood control, irrigation and power. In addition to the officers and civilian employees of the War Department, skilled specialists were employed to study problems in economics, geology, dam design, power and irrigation development. A large amount of data was assembled on climate, vital statistics, population trends, markets, lumbering, mineral resources, irrigation economics and power installations.[30] A complete study was made, the resume of which is four hundred pages (Appendix I of the report) concerning the electrochemical and other major power consuming industries.[31] This information was then studied to determine the probable success of the irrigation project and the future requirements for electrical energy.

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29. Senator Dill from Washington attempted to force through the adoption of the project with provisions for further investigations but not for construction until definitely approved by Congress. This attempt also failed as Congress was afraid of the obligations which might result from formal adoption of the project and preferred to defer all action, awaiting further studies of the project.
30. The Columbia River and Tributaries, H. Doc. 103, 73d Cong., 1st sess.
31. Including the production of aluminum, fertilizer material, copper and copper-alloy, and zinc and lead; the manufacture of chemicals and metals from brine; the cellulose industries; the electric furnace in the iron and steel industry; electric furnace products; and the reduction of gold and silver and rare or minor metals.

On the basis of this report, as well as former surveys made by the State of Washington, the Reclamation Bureau and the Geological Survey, on the Columbia Basin project, a report was submitted by the Bureau in 1932.[32] It concluded that the pumping plan was the most desirable method of irrigating the Basin and that the project was economically feasible. This plan called for (a) the construction of a dam in the Columbia River, 450 feet in height, which would create a reservoir 150 miles long, extending to the international boundary and drowning out the Kettle Falls site; (b) a power plant at the dam with an ultimate installed capacity of 2,100,000 horsepower; (c) a dam at each end of the Grand Coulee to form a reservoir about twenty-three miles long; (d) the irrigation distribution system from the Grand Coulee Reservoir, and power plants and transmission lines along the canals for the generation and distribution of seasonal power. Eight hundred thousand kilowatts of firm continuous power would be available under this plan at the Columbia River power dam for commercial sale. The secondary power would be used to pump water from the Columbia River Reservoir to the Grand Coulee Lake, the maximum difference of elevation between the surfaces of the two being about 365 feet. The water from the Grand Coulee Reservoir would then be used to irrigate 1,200,000 acres of land. The seasonal power generated at various drops on the project canal could be used to lift water a maximum of one hundred feet for irrigating 219,000 acres of the total 1,200,000 acreage in the project.[33]

The Bureau surveyed the region within a three hundred mile radius of the Columbia River Dam and estimated that the demand for

32. This report is printed with the report of the Army Engineers on the Columbia River and tributaries, op. cit.

power would grow sufficiently to absorb all the energy developed at the Grand Coulee site within fifteen years after completion of the dam. Because of the need for power in the irrigation development, the Reclamation Bureau recommended that the Government construct and operate the power plant, but have the purchasers of the power construct the transmission lines to the dam. The value of the power and the estimated price at which it would be sold was estimated just as in the case of Boulder Dam power. The cost of substitute power from other sources was determined and the price of Grand Coulee power set just a little below this figure. The Bureau estimated that the value of energy at the Columbia River plant would be somewhere between 2.5 and 3.6 mills per kilowatt-hour, depending on the load factor and whether public or private agencies should purchase the power. "A price of 2.25 mills per kilowatt-hour should be sufficiently attractive to induce the power companies and municipalities to purchase energy in lieu of constructing additional power plants, either steam or hydroelectric, of their own and to insure that the Columbia River power will be absorbed as rapidly as the growth of load will permit."[34]

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33. The cost of the project is estimated by the Bureau as follows:

Columbia River Dam	$125,750,000
Columbia River power plant	42,616,000
Interest during construction	16,514,000
Subtotal	$185,890,000
Irrigation development without interest (1,200,000 acres)	208,265,000
Total investment	$394,155,000

(H. Doc. 103, 73d Cong., 1st sess.)

34. Ibid., p. 534.

Assuming that (1) the firm power of 800,000 kilowatts of continuous power is absorbed in fifteen years at a price of 2.25 mills per kilowatt-hour; (2) the irrigation development proceeds at the rate of 20,000 acres per year; (3) secondary power for pumping purposes is paid at the rate of one dollar per acre per year, which is equivalent to approximately 0.5 mills per kilowatt-hour; and (4) that the power plant is operated by the Government in order to take full advantage of secondary power for irrigation pumping and thus secure the maximum returns from the installation; the Bureau estimated that the power revenues from the project will be sufficient to repay the cost of the Columbia River Dam and power plant with interest at four per cent per annum within fifty years, in addition to providing for the operation, maintenance, and depreciation of the dam and the power plant, and also provide a surplus of approximately $144,000,000 which would be available for the repayment of the cost of the irrigation development and other purposes.[35] The Bureau calculated that the land would pay annual construction charges, beginning four years after settlement and continuing for four years at a rate of two dollars per acre, and thereafter at $2.50 per acre for thirty-two years. In forty years the water right charges would have repaid half of the cost of the investment in the irrigation project -- the remainder to be met from power revenues.[36] By taxing business interests which would benefit by this development, the water-right charges could be further reduced. The surplus from the power revenues is estimated, accordingly, to be sufficient to repay within forty years about fifty per cent of the cost of the development of the entire acre of 1,200,000, or an aver-

35. Ibid., p. 535.
36. For a schedule of repayments see the above report, pp. 514-6.

age of over eighty-five dollars per acre. The Bureau recommended that the State of Washington, the municipalities, and all interests benefited within the irrigation district should contribute toward the costs of the project to further reduce the burden of the water charges. The development of the land is to proceed in blocks of twenty thousand acres annually after the completion of the dam.

The Secretary of Agriculture, Arthur M. Hyde, also submitted a report in 1932, opposing the adoption of the project on the following grounds:

1) The United States now has a productive agricultural capacity far beyond its needs. In order to prevent surpluses, which are the cause of low prices and the farm problem, the existing cultivated acreage must be reduced by probably thirty or forty million acres.

2) The high cost of irrigating land in the Basin cannot possibly constitute a sound opportunity for any prospective settler. The competition of the settlers in the project would result in depression and heavy losses for other farmers in the Northwest.

3) There is no hope that the export market will absorb American agricultural surpluses. And the future domestic demand for agricultural projects can be met for many years without resort to such an expensive irrigation project.

4) Federal irrigation policy has not, on the whole, proved a success.[37]

The Board of Engineers for Rivers and Harbors did not agree with the Bureau of Reclamation as to the economic feasibility of the project and accepted the views of the Secretary of Agriculture.

37. This report of the Secretary of Agriculture is also printed in the report on the Columbia River, op. cit.

> "The economic feasibility of the plan is largely based on subsidizing irrigation by profits from the sale of power. . . . The economic feasibility is also dependent upon the future growth of power demand over a period of years. This is a question involving many uncertain factors and obviously impossible of exact determination. The Board does not undertake to make a definite prediction, but it is of the opinion that the estimates of the reporting engineers that the growth in power demand will be such that the entire prime output would be absorbed in a period of fifteen years after 1940 . . . . is unduly optimistic. . . . . The Board accepts the views of the Secretary and is unable to recommend the adoption of the project at the present time."[38]

In spite of the opposition of the Board of Engineers and the Secretary of Agriculture, bills were introduced into the House and Senate in 1932 by representatives from Washington providing for the adoption of the project.[39] The provisions of these bills followed the plan of construction and development outlined by the Bureau of Reclamation. The provisions for securing contracts for the power and operating the power project were essentially the same as in the Boulder Canyon Act. These bills were submitted to the Secretary of the Interior, but, although he declared the project physically and financially feasible under the plan contemplated, he did not recommend favorable action at that time because of the unhealthy condition of the Treasury. Hearings were held on the bill, but it was not reported out of the committee because of the objections stated by the Secretary, the opposition to extension of Federal reclamation policy in the face of agricultural surpluses, and the reluctance to "put the Government in the power business."

Opposition to the project from one source or another would probably have delayed the adoption of the project for many years, in

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38. Ibid., p. 12.
39. H. R. 7446 and S. 2860, 72d Cong., 1st sess.

spite of the active work of various organizations in the State of Washington. The question was settled, however, in 1933, by the authorization of the construction of the Grand Coulee Dam by the Public Works Administration. An initial allotment of $15,000,000 was made for immediate commencement of the work.[40] When the project was adopted it was planned to build the so-called "low dam" of three hundred feet in height which would have served only as a power project. It was contemplated that eventually a high dam would be superimposed on this "low dam" for the combined power and irrigation development. Certain physical and engineering complications arose, however, which made the "low dam" impractical. The Secretary of the Interior signed a change order in 1935 providing for the construction of a 177 foot dam, with foundations of sufficient strength to permit economical construction upon it of the high dam, without extensive alteration of the original structure. The high dam will be 550 feet above the lowest point of foundation. The most recent estimates of the Bureau of Reclamation as to the cost of the project are $179,000,000 for the dam and power plant and $198,000,000 for the irrigation system. It is anticipated at the present time that the ultimate power development will be 2,700,000 horsepower.[41] There is no power development in connection with the foundation structure now under contract, but it is expected that the first unit will go in operation in 1942.

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40. An additional $20,000,000 was made available in 1935 under the Works Relief program to continue construction, and the Interior Department Appropriation Act of June, 1936, provided $20,750,000 for the project. The initial development is estimated to cost $60,000,000.
41. By way of comparison, the ultimate capacity of Boulder Dam is 1,835,000 horsepower; Niagara Falls (U. S.), 452,000; Wilson Dam, 600,000; Conowingo, 594,000; and the Dnieprostoy (U. S. S. R.), 750,000.

Planning for the development of the Pacific Northwest.

The Reclamation Bureau has not started construction on the irrigation works or the dams in the Grand Coulee reservoir. As a matter of fact, Congress has not as yet authorized the adoption of the Columbia Basin Irrigation project by the Federal Government. There is little question, however, but that the combined power and irrigation project is to be developed eventually by the Federal Government. The attitude toward this large reclamation project has changed, however, within the past few years. It is no longer being viewed as an isolated undertaking which must be justified on purely commercial grounds, but rather as a part of a broad national land policy. The project can and should be correlated with the Government's farm relief, resettlement and land use program. President Roosevelt has stated on a number of occasions that this basin will offer homes to the less fortunate peoples from the East and South; from the slums and tenements of eastern cities; the dust bowl of the middle west; and the eroded farm lands of the South.[42] The Columbia Basin will offer exceptional opportunities to thousands of farmers. If the project is to be used as an outlet, however, for these farmers now located on submarginal lands, the policies of the Bureau as to settlement and privately owned lands must be changed. The experience of the Reclamation Bureau has definitely shown that financial assistance must be given to the farmers. This will be even more true if the settlers for the project are drawn from the farmers who are now unable to derive a living from their lands. Furthermore, the use of the land must be carefully studied prior to settlement and agricultural direction should be offered in the development of the project

42. Neuberger, op. cit.

and marketing of the products. The per acre construction costs for the irrigation project will be high, and repayment can be realized only under careful management. It is anticipated, from the recent reports of the Reclamation Bureau, that the recommendations of the National Resources Board as to taxation of industries and communities in the irrigation district will be followed, thereby relieving the settlers of part of the financial burden.

One of the greatest difficulties facing the Bureau is that the land is almost entirely in private hands. Large parcels of the land are held by financial institutions and real estate companies who are interested in the sale of the land for profit.[43] The average value of the land in the Basin at present is estimated at fifteen dollars per acre; the average price asked is eighty-six dollars.[44] At the latter price the land will not be able to carry the high water-right charges. The estimate of fifteen dollars an acre is, as a matter of fact, too high for this arid, desert land, and reflects the speculative activity which is taking place at the present times in these lands. As early as 1928 large sections of these lands were bought up by speculators at $1.25 per acre, and have already changed hands

43. About 670,000 acres of land, either in the project or to be benefited by it, are held by the following institutions: the Spokane and Eastern Trust Company, the Northwest Pacific Hypothek Company, the Realty Mortgage Company, the North Pacific Mortgage Company, the Columbia Irrigated Lands Company, the Columbia Basin Land Company, Columbia Land Owners' Incorporated, the Columbia Valley Reclamation Company, the Columbia Highland Company, the Northern Pacific Railway, the Title and Trust Company of Portland, the Big Bend Land Company, the Inland Empire Land Company, the Phoenix Mutual Life Insurance Company, the McMaster Ireland Company, and the Columbia Basin Development Company. (Rorty, James, "Grand Coulee", Nation, Vol. 140 (March 20, 1935), p. 329-31.)

44. Neuberger, op. cit.

as many as ten times. There are four real estate organizations located in the construction town of Grand Coulee which are dealing in land around the dam and Columbia Basin lands.[45]

The only solution to this problem of speculation is condemnation of the project lands either by the Federal Government or the State of Washington or taxation by the State to eliminate items of unearned increments. In view of the previous experience of the Reclamation Bureau, however, one cannot except very much assistance from the States concerning the settlement and development of irrigation projects, or the assumption of responsibility by them for the financial success of the projects. The problems of privately owned lands and the sale price thereof, choice of settlers, financial assistance to the settlers, directed settlement, and taxation of the district should be given careful consideration and a plan for the treatment of these problems devised before the project is opened, or the settlers will inevitably meet the same financial difficulties which have been encountered on the other Federal irrigation projects. If the burden for the successful development of the project is to be placed on the Reclamation Bureau it must have adequate control to deal with these problems.

In addition to the Grand Coulee project the Government has another project on the Columbia River at Bonneville which is being constructed as a public works project under the Department of War. The Bonneville Dam is on the lower Columbia, between Washington and Oregon. It will probably be completed late in 1937. The dam is a combined navigation and power project located near the head of tidewater on the lower Columbia River. It will provide inland navigation

45. Rorty, op. cit.

to The Dalles, a distance of 188 miles from the sea. The channel will accommodate ocean-going vessels with a draft of twenty-six feet. The power plant will have an initial installed capacity of 86,000 kilowatts and an ultimate capacity of 430,000 kilowatts. The initial cost of the project is estimated at approximately $55,000,000; with the ultimate power installation, the cost will be $75,000,000. The Bonneville Dam is the lowermost of the series of ten dams contemplated in the comprehensive plan of the Army Engineers.[46] This series of dams will ultimately utilize ninety-two per cent of the fall of the river with an aggregate installed capacity of more than ten million horsepower. These dams will provide navigation for sea-going ships to The Dalles and for modern barge transportation to Priest Rapids, four hundred miles inland. The storage of water by these dams and the existence of power for pumping purposes will afford vast irrigation opportunities. The Grand Coulee, the farthest upstream of the ten dams in the complete plan, is the great storage dam for the system, creating a lake 151 miles long. Each of the dams below the Grand Coulee will benefit by this storage, for the regulation of stream flow provided thereby will increase the firm power of the downstream plants. Navigation will be aided by the Grand Coulee dam during the low water season and, to some extent, the reservoir will offer a degree of flood control. As much power will be available at the Grand Coulee dam as will ultimately be produced at all seven dams on the Tennessee River. The complete plan also calls for a series of ten dams on the Snake River for the combined purposes of navigation, irrigation, and power. An investiga-

46. See the reports of the Army Engineers on the Columbia River system; H. Doc. 263, 72d Cong., 1st sess.; H. Doc. 103, 73d Cong., 1st sess.; H. Doc. 395, 73d Cong., 2d sess.; and H. Doc. 190, 73d Cong., 2d sess.

tion is also under way at the present time of the entire Willamette drainage area, which river empties into the Columbia at Portland. The anticipated program will provide for several large reservoirs for much-needed flood protection, improvement of navigability of the river, improvement of the quality of the water for domestic usage by regulation of the stream flow, and development of power. The project will also allow the drainage of rich agricultural land of some three-quarters of a million acres.

In all of these projects for the future development of the water and land resources of the Pacific Northwest, the generation of power plays an important role in bearing a part of the joint costs of these undertakings. The most immediate problem facing the Government with regard to the Bonneville and Grand Coulee projects is the distribution of the power from these plants. At the direction of the President, the Federal Power Commission undertook a detailed study during 1936 of distribution areas, prospective markets, customers and rates as a basis for the determination of wholesale rates for the power to be generated at the Bonneville Dam. At the same time, a thorough study was made of this whole problem as to the distribution of power from the Bonneville, Grand Coulee and Ft. Peck Dams[47] by the Pacific Northwest Regional Planning Commission at the request of the National Resources Committee. This Commission reported that the interconnecting transmission line facilities between existing principal power centers of the region are of low capacity and entirely inadequate to serve as the basic means of transmitting the power from the Bonneville and Grand Coulee projects. The Commission, accordingly, outlined the basic factors in a regional grid system to

47. A public works project on the upper Missiuri River.

connect these Government plants with all the public and private plants in the region to serve eventually the power demands of the region. This superpower grid system of transmission lines would be constructed by a Federal agency, coordinating all facilities now in existence. The public agency would also have control over the construction of new facilities in the region to meet the increasing demand for power in the most economical manner. It is suggested in the report that this high-tension transmission system and certain of the intermediate lines might be organized as a system of common carriers of electric energy.[48]

Such a coordinated system is unquestionably necessary if the maximum economies in power production are to be realized. As has been previously stated, however, such a system requires either far greater control over the power industry by the Federal Government than exists at present, or a willingness on the part of the industry to cooperate with the public agencies which has not as yet been apparent. In any event, the transmission lines in the grid system would have to be owned and operated by a Federal agency. With such a coordinated power system, the output of the Bonneville and Grand Coulee plants could readily be absorbed. Without the cooperation of the public and private agencies operating in the region, however, or an increase of Federal control over these agencies, considerable difficulty may be realized in marketing this large output of power in the period originally contemplated by Federal agencies.

As in the case of Boulder Dam, it is also true with regard to the Columbia Basin project, that the aspects of social policy with regard to the sale of power from the Government plant have been en-

48. The Columbia Basin, op. cit., p. 192.

tirely disregarded. The Pacific Northwest Commission was the first agency to consider this problem of public policy and makes the following recommendations with regard thereto:

> "In order to achieve the maximum regional and national benefits . . . requires that the surplus electric energy from Bonneville, Grand Coulee, and such future federally financed public works on the Columbia River and its tributaries as may be built shall become available to the greatest number of people at the lowest practical rates consistent with the solvency of the works used for the generation, transmission, and distribution of such energy. It follows that the operating agency should adopt a policy for the sale of electricity which will make rates similar over large areas, which will pass along the economies in the prices of wholesale power to the ultimate consumer, and which will contribute, insofar as may be wise, to the stabilization of existing communities, the appropriate decentralization of new industries, the increase of steady employment, and the increased consumption of electric energy by farmers and domestic consumers. . . . .
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> The rate policy pursued is an important factor in deterring or increasing consumption. Moreover, the type of consumers wanted can, to some extent, be controlled by the operating policy adopted. It is quite possible to throw the bulk of this energy to large electrochemical industries or it is possible to pursue a policy of balancing use as between industry, agriculture, and the domestic consumer."[49]

The policy recommended by the Commission is similar to that of the Tennessee Valley Authority and looks toward lower rates as a means of improving the welfare of the farmer and domestic consumer as well as stimulating the industrial growth of the region in the desired direction. Such a policy, however, directly conflicts with the plans of the Reclamation Bureau for the irrigation project. Throughout the period that the Grand Coulee project has been under consideration and investigation, there has been no attention given to the possibility of distributing cheap power from the Government project to increase the use of electricity or to benefit the small domestic consumers and the farmers. It was consistently assumed that this

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49. Ibid., p. IX-X.

power would be sold throughout the region at the highest possible rates. As has been indicated in the plan of the Reclamation Bureau, the price for this power was set by prevailing rates in competitive centers, and the profits from the sale of power are an important part of the financial plan for the irrigation project.

Careful consideration should be given to the problem of power as one aspect of a multiple purpose project, and to social policy with regard to the sale of such power from Federal projects. The subsidization of the irrigation project from power profits is unfair and will prevent the realization of the benefits of cheap power production by power consumers. If a subsidy is considered desirable in order to provide homes and an opportunity to make a living to those people who are now on relief or attempting to cultivate submarginal land, this subsidy should come from general taxation -- not from power consumers. Under prevailing rate structures, this burden would be borne primarily by the small domestic consumers. At a recent hearing before the Rivers and Harbors Committee, General Markham, who is in charge of the Bonneville project, indicated that the costs of the dam and reservoir, the fishways and the permanent buildings and grounds, would be divided equally between navigation and power. Such an allocation is purely arbitrary, of course, and is not based on any computations of the benefits afforded by the structure. Under such an allocation, however, the price at which the Bonneville power may be sold is considerably lower than the estimates for the Grand Coulee power. It will be necessary, therefore, to formulate a definite policy with respect to this problem of cost allocation before power is available at the Grand Coulee Dam.

Another problem which must be faced in connection with the Bonneville and Grand Coulee projects is that of payments to the states "in lieu of taxes". Although these states have actively fought for the adoption of these projects by the Federal Government and will realize great benefits from the Government power and navigation projects and the Columbia Basin irrigation development, there is, nevertheless, a demand that the states should share in the revenues from these projects. In view of the fact that Arizona and Nevada were given a share of the excess revenues from Boulder, and Tennessee and Alabama are to receive five per cent of the gross revenues from the Tennessee Valley development, it will probably be necessary to concede Oregon and Washington some return from the Columbia River projects. There should be a uniform policy, however, with respect to these matters of payments "in lieu of taxes" from Federal projects. The National Resources Committee has suggested that "owing to the injustices which frequently result from the traditional methods used in allotting tax returns from such large works, the Federal Power Commission should determine the apportionment of payments 'in lieu of taxes' as between the several States at interest and among local bodies within each State in which the property of the corporation is located. It might also investigate as a basis for such allocations the desirability of distributing these payments on the principle of payments in proportion to electric energy consumed by each local body politic."[50]

Inasmuch as the Bonneville project will probably be completed during this year, some action should be taken by the present session of Congress to provide for the administration of the project. The

50. Ibid., p. XVIII.

Bonneville and Grand Coulee projects should be operated together, as well as any other dams which may be constructed in the future between these two. At the present time the Bonneville Dam is in the jurisdiction of the War Department and Grand Coulee under the Reclamation Bureau. In 1936 a bill was introduced into the Senate providing for the operation of the Bonneville project by the War Department, authorizing the sale of power at rates and under contracts approved by the Federal Power Commission. The bill also provided for the construction of the necessary transmission lines and related works.[51] Presumably the Grand Coulee project was to be left with the Reclamation Service. Such a division of administration is highly undesirable. Furthermore, Federal agencies such as the War Department, the Federal Power Commission and the Reclamation Bureau have not the flexibility, continuity of executive personnel, or freedom from political influences which is required for the administration of such projects.

The Pacific Northwest Commission recommended that a public corporation be created with the sole function of operating and distributing the power from these plants. The corporation would have all the flexibility of a private corporation dealing in power generation and distribution. This public agency would also be concerned with the development of new uses and markets for the power. All other aspects of water and land use in the drainage basin, however, would be delegated to other Federal agencies, including the Reclamation Bureau for irrigation, the Corps of Engineers for navigation and flood control, the Soil Conservation Service and the Department of Agriculture for land use, the Bureau of Fisheries, the Resettlement

51. Sixteenth Annual Report of the Federal Power Commission, p. 6.

Administration, the Rural Electrification Administration, and others. It is doubtful, however, whether such an administrative arrangement would give the necessary coordination of activities in the development of the region. The future progress of the Tennessee Valley Authority will be helpful in determining whether such a plan for administrative organization is preferable to a single public agency charged with all problems as relating to a single drainage basin. Regardless of the administrative set-up, it must be remembered that the impounding or release of water should be centrally directed to meet the many varied uses of water throughout the drainage basin.

With the improvement of the Columbia River for inland transportation, the generation of large quantities of power, the development of irrigation projects, and the consequent growth of towns and markets, there will undoubtedly be an increase of industrial activity in the region. With low cost power and decreased transportation costs, mining and refining processes will be important factors in the future progress of the region. The direction and nature of this industrial activity and expansion will depend in some degree on the power policy adopted by the Federal Government. The Northwest Planning Commission has stressed the need for a better balance between agriculture and industry in the region.

In addition to these more specific problems connected with the development and use of the Columbia River, there are other more general problems of water and land utilization in the drainage area which need attention. The recreational facilities, for example, are outstanding in this region. In stimulating industrial development, preventive measures should be taken to avoid the destruction of such recreational opportunities. The preservation of fish is also an im-

portant aspect of the Columbia River development, as the food fish industry ranks high in economic importance in the region. The War Department is constructing fish ladders at the Bonneville Dam for that purpose. In addition to large water conservation projects, such as the Grand Coulee development, small projects for conservation of rainfall and groundwater supplies are also essential for irrigation and range use throughout the region.

In the wheat growing area of Oregon and Washington both water and wind erosion have wrought damages and necessitate a program of control. In these and other areas of the region, extended dry farming methods have deteriorated the quality of the soil. Throughout the mountainous regions, isolated settlements have developed in the small valleys and the standard of living is low. The Forest Service and Resettlement Administration have attempted to correct some of these maladjustments. In some of these areas of misuse of land the application of erosion preventative measures will be sufficient. In others, a change of land use will be required, to game preserves and wildlife refuges, to forest reserves, or to grazing. Such changes will necessitate some resettlement of the present population and legislative measures to prevent further settlement. The increase of irrigated lands offers one of the best aids to the current resettlement program.

One of the most important aspects of planning for the future development of this region is the forest industry, which is not only the present foundation of the economy of the Pacific Northwest but is also the basic supply for the Nation. These forested areas are also integral aspects of water conservation and soil erosion control. This area contains fifty-five per cent of the entire virgin timber

of the country. Due to State and local policies of taxation and the highly competitive nature of the industry, these resources are being rapidly depleted. In formulating a plan for this region, therefore, new policies must be adopted which will lead to sustaining yields on private and governmentally owned timber lands. As stated by the Northwest Planning Commission, "Under scientific protection and management these valuable timber resources are capable of supplying a permanent livelihood to nearly a million people. Under the planless system now being pursued it is destined to early extinction, with the same consequent disruptions of the social and economic structure which has followed in the wake of timber operations all the way from the Atlantic to the Pacific coast."[52]

A bill was introduced in the House in January, 1937, by Representative White of Idaho, to establish a Columbia Valley Authority, which agency would be empowered to deal with some of these problems of the Pacific Northwest.[53] The essential provisions of this bill are as follows:[54]

1) The Columbia Valley Authority, a government corporation, shall be directed by a board of three members to be appointed by the President with the consent of the Senate, and shall have all the powers and flexibility of a private business corporation.[55]

2) An advisory board shall be created, consisting of the Pacific Northwest Regional Planning Commission,[56] and representatives of the Secretaries of Interior, War, Agriculture, Commerce,

52. The Columbia Basin, op. cit., p. 57.
53. H. R. 117, 75th Cong., 1st sess.
54. See Appendix E for a copy of this bill.
55. The organization and powers of this corporation are similar to those of the Tennessee Valley Authority.
56. This Commission is composed of members of the State planning boards of Idaho, Oregon, Washington, and Montana.

Labor and the Federal Emergency Relief Administrator.

3) The corporation shall have the power to construct dams, reservoirs, power structures, transmission lines and navigation works in the Columbia River Basin, and to unite the various power installations into one or more systems of transmission lines, to produce and distribute electric power, and to do any and all things necessary to carry out the purposes of the act.[57]

4) The corporation is authorized to maintain and operate laboratories and experimental plants and undertake experiments for the distribution of electricity to farm organizations and municipalities; to further the proper use, conservation and development of the natural resources of the Columbia River Basin; to study the question of reforestation within the basin and the proper use of marginal lands therein; to supply water for irrigation and other purposes to States, counties, districts, municipalities and farm organizations.

5) In the sale of surplus power, preference shall be given to municipalities and cooperative non-profit organizations, at contracts for a twenty year period. When sold to public service corporations, the resale price of the power shall be set, and such contracts can be cancelled at three years' notice to supply the needs of the preference group.[58]

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57. The purpose of the act is stated as follows: To improve the navigability of the Columbia River and its tributaries; to provide for flood control of the Columbia River and its tributaries; to provide for reforestation and the use of marginal lands in the Columbia River Basin; to provide for the agricultural and industrial development of the Columbia River Basin; to provide for the irrigation of lands in the Columbia River Basin; to provide for the development of electric power in the Columbia River Basin; and for other purposes.

58. The specific details as to the sale of surplus power closely follow the provisions of the Tennessee Valley Authority Act and the amendments thereto.

6) Upon completion of the Bonneville and Grand Coulee dams they shall be turned over to the Columbia Valley Authority. The corporation is directed to make investigation of the costs of these dams for the purpose of allocating costs to (1) flood control, (2) navigation, (3) irrigation, and (4) power development. These findings shall be final and shall thereafter be used in keeping the book value of said properties. In determining power rates and water right charges, no greater charge shall be made for the investment in dams and reservoirs than has been allocated to power and irrigation respectively.

7) The corporation is authorized to construct any dam which is deemed necessary or feasible for the control of flood waters, and to utilize such stored water for the purposes of irrigation, navigation and power development.

8) It shall be the duty of the corporation to bring about in the Columbia River drainage basin (1) the maximum amount of irrigation, with particular reference to providing sufficient water for existing irrigation projects; (2) the maximum amount of flood control; (3) the maximum benefit to navigation; (4) the maximum generation of electric power consistent with irrigation, flood control, and navigation; (5) the proper use of marginal lands; (6) the proper method of reforestation of lands in the basin; and (7) the economic and social well-being of the people living in the basin.

9) The President is authorized to make surveys which may be useful "in guiding and controlling the extent, sequence, and nature of the development that may be equitably and commercially advanced through the expenditure of public funds, and through the guidance and control of public authority, and for the general purpose of

fostering an orderly and proper physical, social and economic development of said area."

10) The corporation is empowered to sell serial bonds not exceeding fifty million dollars in amount for the construction of any future dams, steam plants, or other facilities deemed necessary for the development of the river by the corporation.

No action has been taken on the bill. It is obvious, of course, that it is modeled after the Tennessee Valley Authority Act. The only major difference is the provision for an advisory committee. Such a committee would be helpful in coordinating the activities of other Federal agencies and state authorities with the Columbia Valley Authority. This proposed act also omits any provisions for payments to the States. The conclusions which were drawn from the experience of the T. V. A. in planning for the development of the Tennessee Valley can be applied to this proposal for the development of the Columbia Valley. The creation of the public corporation is unquestionably the best means of securing the uniform and comprehensive development of the Columbia River system. Without further legislation, however, which will give the public agency adequate authority to enforce the execution of its plans, there can be little expectation of outstanding results in regard to the coordination of power facilities throughout the region and the establishment of a unified grid system, the adoption of proper land utilization and forest management plans, or the direction of the industrial, economic and social development of the region.

Inasmuch as the first power unit will not be completed at the Grand Coulee Dam until 1942, and the combined power and irrigation project will not be developed for some years, there is no immediate

necessity for the creation of such a comprehensive agency as indicated in the above bill. Such an administrative agency will eventually be very desirable to coordinate and plan for the unified operation and comprehensive development of the river. It is essential, however, at the present time, to provide some agency for the operation of the Bonneville project and the distribution of power therefrom. When the President appointed the Committee on National Power Policy in 1937, he requested that suggestions be made for the administration of the project. The Committee accordingly recommended that a special provisional form of administration be set up for the Bonneville project, pending the establishment of a permanent administration for Bonneville, Grand Coulee and other projects in the Columbia River Basin.[59] The Committee recommended the following legislation:

1) The appointment of a director by the Secretary of the Interior, who shall maintain and operate the project, with the assistance of an advisory board consisting of three representatives to be appointed by the Secretary of War, the Secretary of the Interior and the Federal Power Commission.

2) The director shall have power to provide transmission lines, substations and any other necessary facilities to market the power and encourage the widest possible use of electric energy.

3) In disposing of the power, preference shall be given to public and cooperative agencies, and fifty per cent of the power reserved exclusively for these groups until January 1, 1939. Contracts shall be made for a twenty year period with the provision that contracts with private utility companies may be cancelled upon five

59. Bonneville Electric Power Project, Sen. Doc. 21, 75th Cong., 1st sess.

years' notice to satisfy the requirements of the preference group. All contracts may contain conditions concerning resale of power "to insure that resale to the ultimate consumer will be at rates which are reasonable and nondiscriminatory."

The report emphasizes the fact that the benefits of this power development should go particularly to domestic and rural consumers, and the joint costs of the facilities should be fairly allocated among the various uses and benefits of the project. These recommendations for the temporary administration of the Bonneville project have the full approval of President Roosevelt and have been submitted to Congress for consideration.

The Great Lakes-Saint Lawrence Seaway Project

For many years proposals have been made to both the governments of Canada and the United States for the construction of a deep waterway connecting the Great Lakes and the Atlantic Ocean. Numerous routes for this purpose have been discussed. The Canadians have considered connecting the Lakes and Hudson Bay by rail, and then move the goods by boat through the Bay and the Hudson Straits. This is a very direct route to Europe but is ice-locked many months of the year. In the United States there have been proposals for an "All-American" route, by deepening the New York Barge Canal from Oswego to connect Lake Ontario and the Hudson River. The completely All-American route would also necessitate the construction of a canal around Niagara Falls on the American side, rather than using the Canadian Welland Canal. The third route is by way of the lower lakes, the Welland Canal and the St. Lawrence, to be constructed entirely by Canada or jointly by Canada and the United States. The

important aspect of the St.Lawrence route, and the reason for special consideration of the project in this study, is the opportunity for a large power development in connection with the navigation project at the international rapids.

There is, at the present time, a navigable waterway from the head of Lake Superior to the Atlantic via the St. Lawrence, but it will not permit the passage of ocean-going boats. The connecting channels of the Great Lakes -- the St. Mary's River between Lake Superior and Huron, and the Detroit and St. Clair Rivers between Lake Erie and Huron -- have been gradually deepened by the United States to permit the passage of larger, heavier lake boats. In 1930 a project was adopted to deepen the channels to twenty-five feet, which work is now in process. In 1932 Canada completed the fourth new Welland Canal, at a cost of approximately $115,000,000, which has a draft of twenty-seven feet. At the lower end of Lake Ontario, however, cargo must be transferred to light canal boats drawing only 13½ feet of water. Between Kingston and Montreal, a distance of about 180 miles, there are three series of rapids, around which Canada has constructed fourteen foot canals. From Montreal to the ocean, which is 1,003 miles, the channel has a thirty-five foot minimum depth which permits unrestricted passage of ocean vessels.

The Great Lakes-St. Lawrence Seaway is a plan to complete the construction of a ship channel twenty-seven feet deep. This will necessitate deepening the connecting channels in the Great Lakes a few feet and an enlarged lock at Sault St. Larie, but this work will probably be done eventually irrespective of the Seaway project. Of the 180 miles from Kingston to Montreal, the first 115 miles are international waters. The remaining sixty-eight miles are entirely in

Canadian territory. The first sixty-seven miles of the international waters is the so-called Thousand Island section, in which there is at present a twenty-seven foot channel. The entire controversy, therefore, as to the completion of the twenty-seven foot Seaway is the remaining forty-eight mile stretch of boundary water, the International Rapids section. It is the improvement of this section for navigation by ocean going vessels that requires the greater part of the expense and work of the proposed Seaway, and, being boundary water, necessitates ratification of the treaty for the plan of development between the United States and Canada.[60] Of the approximately five million available horsepower on the St. Lawrence, 2,200,000 is within the International Rapids section, and belongs in equal part to the two nations.

60. The cost of the combined project is estimated as follows:

(1) Single-stage development:

Works solely for navigation	$22,000,000
Works common to navigation and power	106,500,000
Works primarily for power	106,500,000
Total cost (2,326,000 installed horsepower)	$235,000,000

(2) Two-stage development:

Upper pool --		
Works solely for navigation	$ 8,093,000	
Works common to navigation and power	53,726,000	
Works primarily for power	57,566,000	119,385,000
Lower pool --		
Works solely for navigation	25,388,000	
Works common to navigation and power	37,130,000	
Works primarily for power	82,643,000	145,161,000
Total cost (2,215,000 installed horsepower)		$264,546,000

Estimated initial expenditure to open navigation and provide 406,400 horsepower in upper pool and 756,600 horsepower in lower plant (remaining installation in lower plant deferred awaiting growth of market)	$238,400,000

The arguments for the navigation aspect of the Seaway project are the same as those offered years ago for the completion of the internal waterway system in the United States; namely, (1) that it is necessary to relieve traffic congestion on the railroad, (2) that it will afford a cheap means of transportation, and (3) that the waterway competition will force the railroads to reduce rates. In addition, the project will develop vast water power resources. During the period 1920 to 1930, emphasis was placed on the navigation aspect of the project, and the arguments offered for it were centered around transportation costs and problems. During recent years, however, public attention has been concentrated more on the power aspect of the proposition, and the public benefits which may be realized from the development of this great power site under public operation. The main lines of support and opposition are apparent from the nature of the arguments for the project. There is widespread support to the project throughout the Middle West, the Pacific Northwest and the New England states, from both the agrarian and industrial interests. This support is primarily for the navigation aspect of the project. The interest in the power development is not based on sectional interests, but is led by that minority group which has consistently urged conservation of natural resources, the development of power wherever possible as one aspect of river regula-

(Cont'd) Estimated initial expenditure to open navigation and provide 1,163,000 horsepower at lower plant (remaining installation at lower plant and all that of upper plant being deferred) $214,500,000

(Survey of the Great Lakes-St. Lawrence Seaway and Power Project, Sen. Doc. 116, 73d Cong., 2d sess.)

tion, and strict regulation of the private power industry.[61]

The opposition to the Seaway comes from powerful organized economic groups, including the seaboard cities and Buffalo, the railroads and the power industry. The reasons for the objections of these groups are obvious. New York, Baltimore, New Orleans, and other seaboard cities naturally object to any diversion of traffic through Canadian ports. The railroads fear a decline of traffic, and the power industry opposes any prospect of public competition. The New York Barge Canal is another complicating factor in the situation. The State has spent approximately $230,000,000 since 1905 in improving the canal, but the results have been disappointing. The construction of the Seaway would probably result in a considerable financial loss to the State. For this reason, it has been suggested that the Great Lakes to the Atlantic route should be by way of the Canal to the Hudson River. Such a route is not only much more expensive than the St. Lawrence Seaway, but it prevents the development of the power sites on the St. Lawrence, which is a vital part of the proposed project.

Agitation for the Seaway began shortly after the War, during which all possible means of transportation had been required. The Great Lakes-St. Lawrence Tidewater Association, composed of twenty-two states, was formed in 1919, and it has been very active in

61. For refutation of the arguments in favor of the project see the study made by Harold G. Moulton for The Brookings Institution, The St. Lawrence Navigation and Power Project, 1929. The arguments of this book were considered at the hearings of the Senate Committee on Foreign Relations in 1933 at some length and witnesses were called for expert testimony. The Committee rejected the conclusions of the book.

A popular account in favor of the project is that of Tom Ireland, The Great Lakes-St. Lawrence Seaway, G. P. Putnam's Sons, New York, 1934.

keeping the project before Congress. The New England-St.Lawrence Waterway Committee, representing the six New England states, was organized in 1923 to make a report on the subject. The Committee reported unanimously in favor of the Seaway project, anticipating that it would result in cheaper transportation for that section of the country. The International Joint Commission was directed to survey the navigation and power possibilities of the project in 1919.[62] A joint board of engineers was created by the two governments to assist the Commission. The reports of these two agencies, which were submitted in 1922, recommended the adoption of the project, inasmuch as the volume of traffic that might reasonably be expected to use this route was sufficient to justify the expense involved in its improvement.[63]

There were many complications, however, as to the proper engineering methods, the division of costs between the countries, the administration of the project, the development of power, the probable market for the power and the revenues which could be expected therefrom, which necessitated further investigations. Another Joint Board of Engineers and the St. Lawrence Commission, under Secretary Hoover, was appointed in 1924. To aid the Commission, the Department of Commerce undertook a survey of the comparative merits and costs of the Seaway and the All-American route, and reported in favor of the

62. The Commission was directed to report on improvements necessary (1) for navigation interests alone, and (2) for the combination of navigation and power interests; the extent to which the improvement would develop the resources, commerce, and industry of each country, the nature and volume of traffic, the basis upon which the costs should be apportioned to each country, and the methods of administration and control.

63. St. Lawrence Waterway, report of the Joint Board of Engineers, Sen. Doc. 179, 67th Cong., 2d sess.; report of the International Joint Commission, Sen. Doc. 114, 67th Cong., 2d sess.

St. Lawrence route.[64] The St. Lawrence Commission favored immediate development of the project, and stressed the transportation aspects of the development.[65]

Under the active direction of President Hoover, negotiations for a treaty with Canada for the proposed Seaway were initiated in 1931, and an agreement was effected in the following year. The essential provisions of this treaty are as follows:

1) A temporary international agency, known as the St. Lawrence International Rapids Section Commission, shall be created to administer the construction of the joint navigation and power facilities at the international section.

2) The entire cost of the undertaking in the International section shall be borne by the United States, inasmuch as the Canadian Government has borne the cost of the new Welland Canal.

3) The total installed capacity in the International section would be 2,200,000, to be divided equally between the two countries and developed in stages.

4) The completion of the canals at the Soulanges and Lachine areas is to be undertaken entirely by the Canadian Government. The United States Government agrees to deepen the connecting channels in the Great Lakes to twenty-seven feet and to construct compensation works.[66]

The Senate Committee on Foreign Relations reported the treaty

64. Great Lakes to the Ocean Waterway, United States Department of Commerce, Domestic Commerce Series No. 4, 1927.
65. St. Lawrence Waterway Project, report of the United States St. Lawrence Commission, Sen. Doc. 183, 69th Cong., 2d sess.
66. For a copy of the treaty see the Second Annual Report of the New York Power Authority, Appendix A.

favorably in 1932, and Senator Walsh (Chairman of the Committee) made every effort to bring it up before the Senate for consideration. A filibuster led by Senators Long of Louisiana and Copeland of New York prevented a vote on the treaty.

The development of power at the St. Lawrence was indicated by President Roosevelt prior to his inaugeration to be an integral part of his power program to extend the use of electricity and lower power rates to domestic and farm consumers.[67] The emphasis, therefore, which was placed on the transportation aspects of the project under the Hoover administration, is now directed to the power aspects under the Roosevelt administration. Before resubmitting the treaty to the Senate, the President requested a resurvey of all engineering and economic aspects of the project by the Army Engineers, the Federal Power Commission and the New York Power Authority. This Board recommended in 1934 that the project be undertaken without delay.[68] In a special message transmitting this report to Congress, the President urged ratification of the treaty and commented on the opposition to the project as follows:

> "It is, I believe, a historic fact that every great improvement directed to better commercial communications . . . . have all been subjected to opposition on the part of local interests which conjure up imaginary fears and fail to realize that improved transportation results in increased commerce benefiting directly and indirectly all sections.
>
> For example, I am convinced that the building of the St. Lawrence Seaway will not injure the railroads or throw their employees out of work; that it will not in any way

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67. A summary of the addresses, remarks and messages of President Roosevelt from 1929 to 1934 indicating his attitude on the Seaway is printed in the Congressional Record, Vol. 78, Part 1, pp. 1757-1772.
68. Survey of the Great Lakes-St. Lawrence Seaway and Power Project, Sen. Doc. 116, 73d Cong., 2d sess.

> interfere with the proper use of the Mississippi or the Missouri Rivers for navigation. Let us be wholly frank in saying that it is better economics to send grain or other raw materials from our Northwest to Europe via the Great Lakes and the St. Lawrence than it is to send them around three sides of a square. . . . .
>
> On the affirmative side, I subscribe to the definite belief that the completion of the seaway will greatly serve the economic and transportation needs of a vast area of the United States and should, therefore, be considered solely from the national point of view.
>
> The other great objective provided for in the treaty relates to the development of electric power. As you know, I have advocated the development of four great power areas in the United States, each to serve as a yardstick and each to be controlled by government or governmental agencies. The Tennessee Valley plants and projects in the Southeast, the Boulder Dam on the Colorado River in the Southwest, the Columbia River projects in the Northwest are already under construction. The St. Lawrence development in the Northeast calls for action. This river is a source of incomparably cheap power located in proximity to a great industrial and rural market and within transmission distance of millions of domestic consumers. . . . .
>
> I have not stressed the fact that the starting of this great work will put thousands of unemployed to work. I have preferred to stress the great future advantages to our country and especially the fact that all of us should view this treaty in the light of the benefits which it confers on the people of the United States as a whole."[69]

Extensive hearings were held by the Senate Committee on Foreign Relations on the treaty. Senators Vandenburg of Michigan, LaFollette of Wisconsin, and Nye of North Dakota led the fight for ratification of the treaty. The opposition was again led by Senators Long and Copeland, who based their opposition on broad generalizations that the project was too expensive, that the expenditure of American money would benefit Canada rather than the United States, and the seacoast would be definitely ruined. Senator Lewis of Illinois also opposed ratification on behalf of the Sanitary District of Chicago, because the treaty contained definite provisions as to the maximum diversion of water from Lake Michigan. The treaty was defeated by a vote of

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69. Ibid., p. 3.

forty-six to forty-two. It has recently been indicated by the President, however, that it will again be presented to the Senate in the near future. The present indications are that the treaty may be received with greater favor, but the possibility of securing a two-thirds majority is still doubtful.

Position of the State of New York.

During the period that the conservationists were seeking effective governmental control of water power sites, interest was aroused in New York state to a realization of the vast power resources of the St. Lawrence River. In a message to the State legislature in 1907, Governor Charles Evans Hughes recommended that the water power of the State "should not be surrendered to private interests but should be preserved and held for the benefit of the people." A law was accordingly passed during that year directing the State water supply commission "to devise plans for the progressive development of the water power of the State under State ownership, control, and maintenance for the public use and benefit and for the increase of the public revenue."[70] All of the investigations of the subject since that time by State agencies have recommended State ownership and development of these resources.

As has previously been stated, private power interests applied for licenses to develop this power on the St. Lawrence shortly after the passage of the Federal Water Power Act. The State of New York has consistently opposed the development of this power by private interests and maintained that the power site, one of the greatest natural resources of the state, should be developed by the state, either alone or in conjunction with the Government navigation pro-

70. Ibid., p. 512.

ject. Governor Smith repeatedly urged the formation of a State corporation to develop the power and transmit the power directly to municipalities. In 1929, Governor Roosevelt requested that a permanent board of trustees be appointed to protect the interests of the State in this power and outline a plan for its proper development. As part of such plan, Governor Roosevelt indicated that every precaution should be taken to assure the consumers of rates based on the actual investment in the power project, even to the point of complete assumption of responsibility by the State for the distribution of the power. The State Legislature did not comply with the request of the Governor for a permanent body, but it did appoint a St. Lawrence Power Development Commission to make an investigation of the problem and the proposals for Federal activity. The law creating this Commission reiterated the rights of the State to this power, declaring that "the natural water power sites in, upon or adjacent to the St. Lawrence River, owned or controlled by the people of the State, or which may hereafter be recovered by them or come within their ownership or control, shall remain inalienable to, and ownership and control shall remain always vested in the people of the state."[71]

In accordance with the recommendations of this Commission, a permanent agency was created in 1931, the Power Authority of the State of New York, to represent the interests of the state in this power of the St. Lawrence River, to negotiate with the Federal Government in regard to the proposed seaway project, and to operate any power development on the river for the benefit of the people of

71. Report of the St. Lawrence Power Development Commission, 1931, p. 17.

the State. Informal conferences were held by the State Department and the Power Authority to arrive at an agreement as to the position and rights of New York State in the proposed development. The position of the state has been that "while the Federal Government had unquestioned authority with respect to the improvement of the river for purposes of navigation, the State of New York had an equally incontestable right to produce and distribute through its recognized agency, the Power Authority of the State of New York, that part of the power developed on the United States side of the international boundary in consideration of paying a fair share of the cost of the project."[72] The attitude of President Hoover, on the other hand, is stated by one writer as follows:

> "President Hoover stood adamant as the champion of Federal supremacy in all matters related to the development. He insisted that the seaway was the major objective, that the production of power was incidental, and that the Federal Government had full authority to dispose of this by-product without regard to the sweeping declaration in the act of the New York Legislature that ownership of the power rested in the people of the State."[73]

The Power Authority wanted definite assurances, therefore, before negotiation of the treaty between Canada and the United States, and requested formal recognition as to the "sole ownership of the State of New York in the waters of the St. Lawrence River and the lands lying thereunder within its boundaries, as well as its right to develop and dispose of the hydro-electric power derived therefrom, subject only to the conditions, (a) that the State agree to pay its fair share of the cost of the entire project; and (b) that the plans of the State for the development of the hydroelectric power are in

72. First Annual Report of the Power Authority, p. 12.
73. Sucher, Ralph G., "From the Great Lakes to the Sea", Current History, Vol. 42 (August, 1935), p. 464.

conformity with the plans of the United States Government for the promotion and protection of navigation and commerce."[74] No formal reply was received by the Power Authority, but it was finally informally agreed that the State of New York, through the Power Authority, would develop all the power alloted to the United States at the International Section. To recognize the State, however, as the sole and absolute owner of the part of the water flowing in the St. Lawrence River and of the land comprising its bed and the power sites in, upon or adjacent to it on the American side of the international boundary would lead to many embarrassing complications later with regard to sites in other states, inasmuch as similar contentions on the part of Arizona with regard to the Boulder Canyon project, and of Alabama, with respect to the Muscle Shoals development, were denied by the Federal Government.

Allocation of costs.

Inasmuch as the costs of the project are to be borne jointly by the Federal Government and the State of New York, the problem of allocating the joint costs of the development could not be delayed as in the case of the Tennessee Valley development and the Columbia River projects. Neither could the whole burden of the project be thrown on power consumers, as in the case of the Boulder Dam project. The subject of cost allocation has, accordingly, been an important one to both the Federal Government and New York State.[75] In 1931

74. First Annual Report of the Power Authority, p. 18.
75. It is interesting to note that the New York Chamber of Commerce based its opposition to the project on the uncertainty which would result from the allocation of costs:
"No scientific principles exist which can be used as a guide in allocating the expenditures on the canal which are for navigation to be paid by the Government, and the expenditures which are for water power and accordingly should be self-sustaining. The result will be that the private elec-

the St. Lawrence Power Development Commission stressed the importance of immediate agreement on this point and suggested the following bases for cost allocation:[76]

1) Arbitrary apportionment of fifty per cent of the common costs of the combined enterprise to navigation and fifty per cent to power. "Such an allocation is a frankly arbitrary one, but it may be justified on the ground that no truly scientific basis of apportionment can be found. It would result in the development of a navigation scheme at a total cost of approximately $71,000,000 despite the fact that a similar navigation project, if constructed alone, would cost $120,000,000."[77]

2) Allocation to navigation of such portion of joint costs as would bring the total outlay for the navigation project to a sum equal to the estimated cost of the so-called inferior independent navigation scheme. The latter would cost approximately $79,000,000; thus leaving the power feature carry $124,000,000 of the total cost of $203,000,000, involved in the complete combined project.

3) Allocation of the entire cost of combined project in the proportions which the cost of each project, if constructed alone,

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(Cont'd) tric power industry will not know for years what competition to expect from the St. Lawrence. Also, the railroad industry will be uncertain as to the effect the opening of the canal will have upon its business." (Congressional Record, Vol. 77, Part 5, 4 4495.)

76. As a basis for this discussion the following cost figures were used:

Works exclusively for navigation	$20,773,000
Works jointly for navigation and power	101,495,000
Works exclusively for power	81,150,000
Total	$203,418,000

(Report of the St. Lawrence Power Development Commission, 1931.)

77. Ibid., p. 23.

would bear to the sum of the costs of both of these projects if constructed alone. For example, the cost of constructing a similar navigation project alone would be approximately $120,000,000; of the power project alone, $153,047,000. This formula would accordingly allocate to power fifty-six per cent of the entire cost of the combined project and forty-four per cent to navigation. The total outlay for power would be roughly $113,000,000, and for navigation, $90,000,000. The Commission expressed no opinion, however, as to the desirable formula to be adopted. It does state that "from a theoretical point of view something could be said for a basis of allocation which would apportion joint costs in proportion to the relative public advantages of the navigation end of the project on the one hand and the power end on the other hand." The Commission concludes, however, that such discussion would have no practical value, for "even with respect to the power end of the project, no pecuniary estimate can be made as to the total benefit, direct and indirect, which it will confer on the people of the state of New York. The impossibility of measuring the benefit resulting to the entire United States from the navigation scheme is even more obvious."[78]

Immediately after the organization of the Power Authority, negotiations were opened with the State Department to determine definitely the rights of the State and the division of costs so that they could be embodied in the treaty. The State department was very evasive, however, and hostile toward the State agency. At one of the first conferences, the Federal representatives proposed that the State should pay $150,000,000 in consideration for the development and use of the St. Lawrence power. It was frankly declared at that

78. Ibid., p. 22.

time to be the purpose of the Federal Administration "to make the power project carry as much of the total cost of the entire St. Lawrence development as possible or, as they expressed it, 'all the traffic will bear'."[79] This proposition was definitely rejected by the Authority, as it would make cheap power production impossible.[80] The Power Authority suggested that the cost of the works common to power and navigation be divided equally. The State Department refused to commit the Federal Government to any definite proposition and took the position that the agreement which was in process between Canada and the Province of Ontario should govern the understanding between the State of New York and the United States. This proposal was also rejected by the Power Authority. As a result of the failure to arrive at any agreement as to cost allocation, the treaty, as signed in 1932, contains no provisions with regard to this matter.[81]

The problem of cost allocation came up at the hearings of the Senate Committee on the treaty, and it was agreed that some understanding should be reached before the treaty was submitted to the Senate. A conference was had by the Power Authority and the War

79. Second Annual Report of the Power Authority, p. 16.
80. The attitude of the Power Authority is fully stated in a letter of Vice-Chairman Cosgrove to the Assistant Secretary of State. See Appendix C of the Second Annual Report of the Power Authority.
81. The negotiations with the State Department were further complicated by the fact that the Power Authority objected to the two-dam proposal of the Canadian engineers, which was finally accepted by the American engineers. This plan is more costly than the single-dam development. The Power Authority adopted the position that the power development should not be required to pay more than the power project would cost if constructed in accordance with the most economical plan. (See the Second Annual Report of the Power Authority, p. 18.)

Department and a general understanding was reached that the United States would assume all costs for navigation, that New York assume all costs for power, and that the costs of the joint works would be shared equally. The share of New York, however, was not to exceed a total based on the estimate of the final report of the Joint Board of Engineers in 1926.[82] This agreement was embodied in a joint resolution and passed the House on April 26, 1933, but was defeated in the Senate.[83] This allocation of costs has been generally accepted, however, and legislation to that effect will probably be passed if the treaty is ratified by the Senate.

Power policy of New York State with regard to the St. Lawrence Project.

When the St. Lawrence Power Development Commission studied the problem of distributing this power, it stressed the importance of this large block of cheap power in extending lower rates to domestic consumers and encouraging rural electrification.[84] Throughout the report the Commission emphatically urged that the smaller consumers (domestic, rural and commercial) should be the beneficiaries of low-cost production of power; and that the potential competition from the publicly-owned system should be used to its utmost to secure the maximum possible reductions in rates to the small consumers. With

82. On the basis of these figures, therefore, the United States would pay $125,765,250, and the State of New York, $89,726,000 of the total cost. The agreement of New York to this cost allocation was based on the assumption that it should have the right to utilize for power all the flow of the river in the International Rapids section alloted to the UnitedStates.

83. H. J. Res. 157, 73d Cong., 1st sess.

84. "In fixing the rates to be charged consumers, by contract with utility companies, the Trustees should seek to encourage a larger use of electricity in the home and on the farms by low promotional rates, giving domestic consumers a preference." (Report of the St. Lawrence Commission, op. cit., p. 10.)

this purpose in mind, it was recommended that the principle of "selling on a commercial basis" (maximization of profits) should be applied to industrial consumers of power, and that the resulting profits on this business should be applied to the reduction of rates to other consumers.[85]

The public policy of the State of New York with respect to the use and distribution of the St. Lawrence power is in accordance with the recommendations of this Commission and is definitely stated in the law creating the Power Authority as follows:

> "... the said project shall be in all respects for the aid, improvement, and benefit of commerce and navigation in, through, along and past the St. Lawrence River and the international rapids section thereof, and that in the development of the hydro-electric power therefrom the said project shall be considered primarily as for the benefit of the people of the state as a whole and particularly the domestic and rural consumers to whom the power can economically be made available, and accordingly that sale to and use by industry shall be a secondary purpose, to be utilized principally to secure a sufficiently high load factor and revenue returns which will permit domestic and rural use at the lowest possible rates and in such manner as to encourage increased domestic and rural use of electricity."[86]

In all of its reports, the Power Authority has stressed this power policy and has urged legislation which would allow municipalities, cities, rural organizations and power districts to take advantage of the low-cost public power. The Municipal Ownership Law was passed in March, 1934, providing that the cities of the State may establish or acquire systems for the generation and distribution of electricity without the necessity of obtaining charter amendments from the State legislature.[87]

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85. Ibid., p. 30.
86. Fourth Annual Report of the Power Aithority, p. 57-8.
87. Fifth Annual report of the Power Authority, p. 13.

Coordination of power systems.

All of the reports dealing with the problem of marketing the power from the St. Lawrence project have emphasized the importance of utilizing this power output in conjunction with the existing power supply of the State. If the project were to be operated as a single enterprise, there would be an enormous waste of power for the output is continuous. By coordinating this power with other hydro plants and existing steam plants, however, all of this power can be utilized. The St. Lawrence power will meet the base load, and the other plants will supply the peak demand. The Power Authority reported in its Fifth Annual Report that "a report outlining a comprehensive plan for the coordination of St. Lawrence and Niagara power with existing generating and transmission facilities of the State" would be submitted at a later date. "The report will cover proposals for establishment of a public transmission 'Grid' to coordinate the power resources of the State of New York in the general interest."[88] The broad outlines of such a plan would include a State controlled transmission system; complete coordination of public and private water power development with the most efficient fuel generating stations to produce the most economic average cost of power; and superpower generation and transmission.[89]

As in the case of the Tennessee Valley Authority and the proposed Pacific Northwest agency, however, the New York State Power Authority does not have the power to establish such a coordinated grid system and must depend, under present laws, on the willingness of the private power companies to cooperate. The hostile attitude which the private companies in the State have taken toward the project and the

88. Fifth Annual Report of the Power Authority, p. 15.
89. Fourth Annual Report of the Power Authority, pp. 48-50.

Power Authority to date nullifies any hope of such cooperation. The private companies have consistently fought the Seaway project and have contended (1) that St. Lawrence power will have to be sold at low rates primarily to industry located near the site as the residential market could not absorb more than fifteen per cent of the output; (2) that the sites on the Niagara River and the St. Lawrence really belong to private interests by reason of alleged riparian rights attached to small parcels of land held by the Niagara-Hudson Power Company; (3) that the sites should therefore be developed by the private company as the demand for such power arises; and (4) that if the State and the Federal Government insist on developing the project, all the power should be sold at the plant to private interests. Inasmuch as the Niagara-Hudson Power Corporation would be the only company bidding for this power, the State Authority would have to sell the power on the private company's terms. It is not anticipated that the Niagara-Hudson Power-Consolidated combination, which controls ninety per cent of the electrical energy in the State, will willingly cooperate with the Power Authority.

Failing in the accomplishment of such a coordinated system, or prior to its establishment, the Power Authority has recommended full development and unified operation of all the State-ownedwater power resources.[90] The St. Lawrence and Niagara projects would carry the base load for the system, while the daily or seasonal peak would be carried by the hydro plants where water storage is possible, or fuel burning plants.[91] Such a coordinated system is described by the

90. (See next page for this footnote.)
91. See the Fourth Annual Report of the Power Authority, p. 33.

Power Authority as follows:

> "The future of water power development in New York State lies in the provision of adequate storage for the interior streams and in selective development and operation of plants on these interior streams in harmony with the great continuous powers of the St. Lawrence and the Niagara. Although the cost of development on the interior streams is uniformly greater, the ability to furnish peak power makes their output more valuable.
>
> These possibilities can be realized to their fullest extent only by stream regulation and the harmonious development and operation of a number of plants on a stream, or group of streams, in accordance with a well-ordered plan, and by providing the necessary transmission ties, so that operation can be based on a community of interest and that development will no longer be governed by local considerations or the immediate market."92

Before such a coordinated, unified system of water and steam plants can be realized, however, the Power Authority must be given far greater power than it now has to construct generating plants, dams, reservoirs, and the necessary transmission lines. At the present time its authority is limited to the St. Lawrence project, and it does not even have sufficient authority to construct transmission lines to carry out the stated power policy of the State.

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90. The undeveloped water power in which the State owns part or entire interest are as follows:

Stream	Horsepower
Lower Niagara	180,000
Niagara River	600,000
St. Lawrence River	900,000
Ausable River	1,500
Genessee River	27,000
Hudson River	60,000
Raquette River	10,000
Saronac River	1,500
Total	1,810,000

92. Fourth Annual Report of the Power Authority, p. 75.

Development of the Central Valley

The Sacramento and San Joaquin River basins, known as the Central Valley of California, have been intensively cultivated by irrigation from surface streams and groundwater supplies. This development has taken place in a haphazard, uncoordinated fashion by individual enterprise and irrigation districts. The result has been an acute shortage of water during certain seasons of the year, conflicts between various interests in the Valley for the available water supply, and excessive lowering of the groundwater table. With the drop in groundwater pressure, salt water from the ocean has penetrated the delta region and destroyed the quality of the water for irrigation, domestic and manufacturing usage. Both of the river systems are badly polluted, and the disposal of sewage and waste is a serious problem during the low-water season. The flood problem is also serious in certain parts of the Valley. The appropriation of surface water in the upper sections of the basins for irrigation purposes has rendered water transportation impossible during parts of the year and destroyed a considerable amount of water-borne commerce. The future of this region depends almost entirely on water supply -- for agriculture, power, domestic and manufacturing supply.

The State of California recognized the serious need for coordinated use and control of the water supply of the Valley early in the twenties, and directed the State Department of Public Works to make a thorough study of the problem. The purpose of the study was to devise a unified plan for the use of the available water supply to the greatest public advantage -- covering irrigation, power development, domestic and manufacturing supply, navigation, flood control, hydraulic mining, and prevention of the encroachment of sea

water in the delta of the Sacramento and San Joaquin Rivers. The plan, as outlined by the Department, requires a series of multiple purpose reservoirs in the foothills which will regulate stream flow, thereby aiding navigation and the pollution problem, store water for irrigation purposes, domestic and manufacturing supply, allow power development, and aid in flood prevention. Secondary power will be used for pumping water to irrigated lands. Underground reservoirs are to be developed and the use of such water controlled. A supplementary water supply is to be obtained from the Trinity drainage basin.[93] A pumping project is also contemplated to take surplus water from the Sacramento River to meet the needs of deficit areas in the lower San Joaquin Valley.[94] The President's Interdepartmental Committee on Water Flow has also suggested that the project may include extensive organized measures for forest management, the preservation and restoration of wildlife, the control of hydraulic mining, watershed management and silt control.[95]

It has been recognized by all these planning agencies, however, that the execution of this plan must be under unified control and that all interests in the Valley must cooperate with the controlling agency. As stated by the Engineering Advisory Committee for the State of California:

> "The Committee feels that it would be lacking in candor if it did not point out at this time that the value of such a plan depends entirely upon its ultimate completion

93. For the details of the comprehensive plan see the reports on the Water Resources of California, Division of Engineering and Irrigation, Department of Public Works, State of California. Also see the report of the United States Army Engineers on the Sacramento, San Joaquin and Kern Rivers, H. Doc. 191, 73d Cong., 2d sess.
94. Public Works Planning, op. cit., p. 123.
95. Development of Rivers of the United States, op. cit., p. 7.

and operation as outlined, no matter whether constructed by private interests, by the state or Federal Government, or by any combination of them.

In order to obtain the benefits of coordination which is the essential feature, it is necessary that the plan be adopted as a whole and a policy be devised that will insure its progressive execution in harmony with existing, pending and future local projects, and that when completed the whole be operated in accordance with the method outlined. With such a policy adopted construction may proceed by units."[96]

In 1933 the State of California created the Central Valley Authority, but lack of funds prevented the initiation of any construction work by this agency. The project has recently been adopted by the United States Reclamation Bureau, as a public works project. The Bureau is now completing preliminary studies preparatory to construction. The Kennett Dam and reservoir and the Keswick Afterbay are to be constructed as a unit on the Sacramento River, for the combined purposes of stream regulation for navigation, storage for irrigation, flood and salinity control, and power development. The Friant Dam and power plant are to be constructed on the San Joaquin River. The primary purpose of this project is to store water to meet the needs of existing irrigation developments in the Valley. The Reclamation Service is also to build the Kern County and Madera Canals from the reservoir to these irrigation districts. Some secondary power will be available on the canals. The total cost of the project is estimated at $170,000,000, to be repaid by the revenues from sale of power and water. As in the case of the Boulder Dam, the power from these plants is to be sold at the highest possible rates in order to finance the project. The control of the Reclamation

96. Summary Report on Water Resources of California, Bulletin No. 12, Division of Engineering and Irrigation, Department of Public Works, p. 23.

Bureau is limited to the dams and reservoirs. Contracts are to be made with the irrigation districts, as in the case of the Imperial Valley, and the power will be sold at the switchboard. Insofar as the drainage basins of these two rivers are located entirely within a single state, it is possible that the state authority may be able to develop the region in a coordinated, comprehensive fashion, co-operating with national agencies wherever the plan may be national in scope. To the present time, however, no action has been taken by the State in the direction of strict regulation of land and water use in the Valley.

Proposed Legislation for the Coordinated Development of Other River Basins in the United States

During the past few years, a number of bills have been introduced into Congress providing for the creation of public agencies to direct and control the development of important drainage areas in the country, including the Arkansas, the Missouri, the entire Mississippi River system, the Potomac and the Connecticut. These bills are very similar to the Tennessee Valley Authority Act and the proposed Columbia Valley Authority Act. Although no legislative action has been taken on these bills, they are, nevertheless, important indications of the trend of public opinion and the direction of future national policy with respect to water resources. The essential provisions of these bills will, accordingly, be briefly considered.

The Arkansas Valley Authority.

Several bills were introduced into Congress in 1934 providing for the development of the Arkansas River system. A complete plan of development would include a series of multiple purpose reservoirs

for much needed flood control, irrigation of semiarid lands in the upper portion of the basin, supplementary irrigation for rice culture, navigation, power generation, reclamation of overflow lands, erosion control, withdrawal of poor lands from cultivation, and reforestation. The purpose of the bill introduced by Representative Marland is stated as follows:

> "To provide for the control of the flood waters of the Arkansas River and its tributaries, to provide for the irrigation, agricultural development, and terracing of lands in the Arkansas River Watershed, to provide for the development of electrical power along the streams in such watershed, to provide for the reforestation of lands suitable therefor in such watershed, and to provide for the economic and social well-being of people living in the Arkansas River Watershed."[97]

To accomplish this purpose, an Arkansas River Watershed Authority was to be created, with a board of directors composed of three members. This corporation was to have the following powers:

1) To construct, maintain and operate dams, reservoirs, diversion canals, irrigation works, terrace lands suitable therefor, build electrical power plants and transmission lines, acquire and reforest lands suitable therefor in the Arkansas River Watershed, and do such other things as are provided in this Act to aid and improve the economic and social well-being of the people living in the watershed area.

2) To make contracts for the storage and delivery of water for irrigation, municipal and domestic uses to States, political subdivisions, municipalities, and irrigation districts. Such contracts would be for permanent services, and the charges for such water were to be fixed by the Board.

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97. H. R. 6368, 73d Cong., 2d sess. See Appendix F for a copy of this bill.

3) To build any works necessary to facilitate and promote a correlated system of irrigation of arid and semiarid lands in the region.

4) To terrace any lands necessary for agricultural usage to prevent soil erosion.

5) To operate hydroelectric plants wherever there are suitable sites, providing an adequate market exists for the power, and to build and maintain transmission lines for the delivery of such power. Contracts for the sale of such power shall be for one year, and the charges determined by the corporation.

The same provisions for surveys and legislation for regional planning to further the development of the national resources, to realize the maximum benefits of the coordinated development of water and land resources in the region, and to promote the economic and social welfare of the people in the Valley which were embodied in the Tennessee Valley act are included in this bill, and in all the other bills considered in this section. The bill also included a provision giving the consent of Congress to the States in the drainage basin to negotiate interstate compacts for the development of the Arkansas River and its tributaries and providing for the storage, diversion, and use of the waters of such river system. There is nothing in the bill, however, with regard to social policy with respect to the distribution of power, the allocation of costs of these multiple purpose undertakings, payments in "lieu of taxes" to the States in the region, or the rights of individuals, private corporations or political agencies to develop water projects in the region.

A similar bill was introduced by Representative Disney during the same session of Congress, providing for the coordinated develop-

ment of the areas drained by the Arkansas, Red and White Rivers under the jurisdiction of a Federal corporation.[98] This bill specifically provided that all projects within the region affecting the water and land resources should be under the jurisdiction of the public agency, and application for the construction and completion of any such project should be made to this Commission. This provision would insure the development of the river system in accordance with the comprehensive plans of the public authority.

The Missouri Valley Authority.

There is a wide variation of climatic conditions in the Missouri Valley which changes the relative importance of the various aspects of water utilization in the different sections of the region. In the western part, the lack of rainfall necessarily places emphasis on irrigation. Numerous power possibilities exist in this part of the basin but, at the present time, the market for power is limited. In the more densely populated eastern portion of the region, there is no need for irrigation and power assumes prior importance. At the Kansas Cities there exists a serious flood problem which the Army Engineers have considered of national importance.[99] As has been indicated in Chapter I, the Missouri River has long been an adopted project of the Federal Government for navigation improvement. The present project calls for improvement of the river to Sioux City, with a nine-foot channel. Most of this work has been completed.

In 1934 the construction of the Ft. Peck Dam and reservoir was authorized by the Public Works Administration, the work to be done by

98. H. R. 7339, 73d Cong., 2d sess. See Appendix G for a copy of this bill.
99. Report on the Missouri River, H. Doc. 238, 73d Cong., 2d sess.

the Department of War. This project will soon be completed, and plans must be made for its operation and administration. It is 240 feet above the level of the water and is the largest earth filled dam in the world. The storage capacity of the reservoir is six times that of the Norris Dam in the Tennessee Valley. This project was outlined by the Army Engineers as part of the comprehensive plan for the development of the Missouri River, and serves the multiple purpose of improvement of navigation, flood control, storage for irrigation, and power development.[100] Its primary purpose is to regulate stream flow to provide a dependable nine-foot channel for water transportation. The Mississippi Valley Committee has estimated that the Fort Peck Reservoir "will cost approximately $86,000,000, and, in addition to improving the navigability of the river, probably will yield immediate benefits in connection with power development and flood control having a capitalized value of ten million dollars. Further expenditures may make possible ultimate power and irrigation developments with an estimated capitalized value of forty million dollars."[101]

The bill introduced by Representative Burdick in 1936 proposed "to provide for the control of flood waters of the Missouri Valley; to improve navigation of the Missouri River; to provide for irrigation of arid and semiarid lands, divert the flood waters of the Missouri River to receding or receded natural lake beds; to provide

100. Report on the Missouri River, op. cit.
101. Report of the Mississippi Valley Committee, op. cit., p. 173.
A complete description of the Fort Peck project and the anticipated benefits therefrom are given in the hearings on S. 3524 (the Mississippi Valley Authority bill) before a subcommittee of the Senate Committee on Agriculture and Forestry, 74th Cong., 2d sess., pp. 348-53.

for the restoration and preservation of the water level of the Missouri Valley; to protect the fertility of the soil of the Missouri Valley; to provide for the generation, distribution and sale of electricity; and other purposes."[102] For this purpose a Missouri Valley Authority was to be created, with the power to construct dams, diversion ditches, reservoirs, power structures, transmission lines, stand-by steam or hydro plants to convert secondary power into primary power, navigation projects, and incidental works in the Missouri River and its tributaries, and to unite the various power installations into one or more systems by transmission lines. In addition to providing for the comprehensive development of the Missouri River system, the Authority is also to determine the proper use of land within the region, the proper method of reforestation, and to plan, in general, for the economic and social well-being of the people living in the Valley. It was not intended, however, that the public agency should supply water for individual water users, but rather to sell such water to corporations or, preferably, to cooperative farmers' irrigation organizations. Upon completion of the Ft. Peck Dam, it was to be turned over to this Authority. Definite provisions were included in this bill for cost allocations to prevent the subsidization of certain aspects of the project by power consumers or irrigation organizations.[103]

102. H. R. 11958, 74th Cong., 2d sess. See Appendix H for a copy of this bill.

103. "The corporation shall made a thorough investigation as to the cost of said dam, and as to the cost of any dam provided for in this Act, for the purpose of ascertaining what part of the cost of said dams and other improvements shall be allocated and charged to (1) flood control, (2) navigation, (3) irrigation, (4) diversion, and (5) power development. The findings thus made by the corporation, when approved by the President of the United States, shall be final, and such findings shall be used thereafter in keeping the book value

The Mississippi Valley Authority.

Also in 1936 a bill was introduced by Senator Norris providing for the comprehensive development of the entire Mississippi Valley, with the exclusion of the Ohio Valley which was to be put under the jurisdiction of the Tennessee Valley Authority.[104] The objects of the proposed act were (1) to provide for the control of the flood waters of the Mississippi Valley; (2) to improve navigation on the Mississippi River and its tributaries; (3) to provide for the irrigation or arid and semiarid lands; (4) to provide for the restoration and preservation of the water level in the Mississippi Valley; (5) to provide for the protection of soil fertility in the Mississippi Valley; and (6) so far as consistent with and in order to lessen the expense of flood control, navigation, and irrigation, to provide for the generation, transmission, distribution and sale

(Cont'd) of said properties.

In fixing the amount which farmers or organizations of farmers, or others, shall pay for water stored by the corporation to be used by such organizations for irrigation, no greater charge shall be made for said water than will be sufficient to reimburse the Government for the cost allocated to irrigation. In fixing the amount thus allocated to power, no purchaser of electric current shall be charged a greater amount than will be sufficient to reimburse the Government for the cost allocated to power. It ishereby declared to be the intention of this Act that the users of water for irrigation shall not be required to pay any part of the projects herein not allocated to irrigation, and that the users of electricity shall not be required to pay any part of said projects not allocated to power, but that the charges for water to be used for irrigation and the charges for power shall be based, respectively, upon the allocations to irrigation and power; that when the Government has been paid in either case, the entire amount expended for irrigation or for power, the charges thereafter assessed against irrigation or power shall only be sufficient to pay its part of the maintenance, upkeep, and management of said projects thus allocated either to irrigation or power." (Sec. 12.)

104. S. 3524, 74th Cong., 2d sess. See Appendix I for a copy of this bill.

of electricity. The bill provided for the creation of a government corporation, to be known as the Mississippi Valley Authority, with powers similar to those indicated above for the Missouri Valley Authority, in order to achieve the maximum utilization of the waters of the Mississippi River and its tributaries, adequate flood control, reclamation of land, regulation of land use, reforestation, and soil erosion control. The Ft. Peck Dam was to be turned over to this agency and definite provisions were included for the allocation of costs, to serve as the basis for power and water charges.[105]

Hearings were held on the bill, at which there was registered the expected opposition of the power interests, who viewed the bill as purely a power proposition. There was general opposition to the bill, however, even from the proponents of planned, coordinated development of water and land resources, because of the scope of the project. It was generally felt that the Mississippi Valley is entirely too large an area for any administrative agency to control. The plan of development would necessarily be so complicated that it would be unwieldy and lead to bureaucratic inefficiency.

The Potomac Valley Authority.

The most important aspect of the Potomac River is power development. By combining this power with the interconnected system surrounding the Potomac Basin, it could be profitably developed. The Army Engineers reported in 1933 that there was a market for this power.[106] At the same time, the dams and reservoirs constructed for power in the comprehensive scheme would (1) provide inland naviga-

105. These provisions regarding costs and charges are identical with those indicated for the Missouri Valley Authority.
106. Report on the Potomac River, H. Doc. 101, 73d Cong., 1st sess.

tion to Cumberland; (2) have a beneficial effect on flood conditions throughout the Valley; (3) provide several bridges across the River which are needed at the present time; and (4) increase the recreational value of the Great Falls.[107]

A bill was introduced at the present session of Congress by Representative Rankin, who has long been interested in the problems of water resources, for the comprehensive development of this drainage basin.[108] The purpose of the bill is to provide for the "development and improvement of navigation and of electric power on the Potomac River and its tributaries, and control of floods and soil erosion." To accomplish this purpose, the Potomac Valley Authority is to be created, and controlled by a board of three administrators. The duties of this Authority are indicated as follows:

1) To make a complete survey of the Potomac River Valley and formulate a comprehensive plan for the location of dams, power stations and appurtenant structures, bridges and highways, and soil erosion control measures for the Valley. An appropriation of five million dollars is authorized for the commencement of construction of essential facilities and the preparation of surveys and reports. As in the case of the Tennessee Valley Authority, however, the construction of specific projects in the Valley must be specifically authorized by Congress. This Authority is not, however, to be given

107. "The comprehensive power scheme would increase the period during which the best scenic effect at the falls could be observed, and would thus improve any park which might be created in the vicinity of the Great Falls. Without changing the other major scenic features of such a park, the power pools would add greatly to the recreation features and possible enjoyment of the pari." (Ibid., p. 31-2.)

108. H. R. 3488, 75th Cong., 1st sess. See Appendix J for a copy of this bill.

the right to issue bonds.

2) It is anticipated in the bill that part of the power generated at the dams on the River will be sold to the United States within the District of Columbia.[109] For this purpose, the Authority is empowered to construct or acquire the necessary facilities, such as stand-by steam plants, transmission and distribution lines.

3) In the sale of additional surplus power, the provisions are identical with those of the Tennessee Valley Authority Act. For the first time, however, the social policy with respect to the sale of power from these Federal projects is definitely stated, and it is identical with that of the State of New York as expressed in the law creating the State Power Authority.

> "It is hereby declared to be the policy of the Government so far as practical to distribute and sell the surplus power generated by the Authority equitably among the States, counties and municipalities within transmission distance. This policy is further declared to be that projects herein provided for shall be considered primarily as for the benefit of the people of the section as a whole and particularly the domestic and rural consumers to whom the power can economically be made available, and accordingly, that sale to and use by industry shall be a secondary purpose, to be utilized principally to secure a sufficiently high-load factor and revenue returns which will permit domestic and rural use of electricity." (Sec. 14.)

The Connecticut Valley Authority.

A bill is also pending in the present session of Congress providing for the development of the Connecticut River Valley.[110] Navigation, flood control, the prevention of soil erosion, elimination of pollution, reforestation and the creation of recreational areas are all important and integral parts of the future development

109. This project has long been under consideration. The Federal Power Commission made a survey of power sites on the Potomac in 1921 and recommended that power be developed by a public agency to serve the needs of the Government.

110. H. R. 4811, 75th Cong., 1st sess. See Appendix K for a copy of this bill.

of the Valley and the protection of its water and land resources. The bill provides for the creation of a Federal agency, the Connecticut Valley Authority, to construct and operate the necessary projects for river regulation and development, the elimination of pollution, and prevention of soil erosion, and is to be assisted by an advisory planning commission to be selected by the Governors of the New England States. The bill also provides that ten per cent of the gross proceeds received by the corporation from the sale of electricity or water in any of the New England states shall be paid to such State wherein received.

Although it is not anticipated that any immediate action will be taken by Congress to establish such agencies as proposed in these bills, they are significant as indications of the trend of national policy in the following respects:

1) The drainage basin is the unit of development and all aspects of water utilization and conservation within the region are to be included in the coordinated plan.

2) The use of land resources are considered an integral part of the problem of conserving and realizing the maximum benefits from water resources.

3) The ultimate purpose of planning for the use of both land and water resources is the betterment of social and economic conditions of the people living in the region.

4) The Government corporation, possessing the powers and flexibility of the private corporation and removed from the political spoils system and influences, is unanimously accepted as the proper administrative agency.

5) Public policy as indicated in these bills with respect to the use and distribution of power produced by the corporations, as part of the comprehensive plan of development of the river system, is, (1) to reduce rates to small domestic consumers and farmers by passing on the economies of production; (2) to promote the widespread use of electricity; (3) to foster industrial development insofar as deemed desirable to better the economic and social conditions of the people living in the region. In order to insure the adoption of this policy, the recent proposals have included definite provisions for cost allocations which will limit the power rates to a fair share of the joint costs and prevent the subsidization of other aspects of the comprehensive plan of development by power revenues.

SUMMARY AND CONCLUSIONS

This study of national policy reveals that the concept of national interest in water resources has undergone a fundamental change in the past few years. In the past, the Federal Government has considered each aspect of water utilization separately and has taken action only when pressed to do so by private or political interests. For many years Senator Newlands attempted to secure the passage of legislation creating a Waterways Commission with sufficient authority to direct the use of water in accordance with a coordinated plan. The Rivers and Harbors Act of 1917 authorized the creation of a Waterways Commission to act as a general planning agency and coordinate the activities of State and Federal agencies concerned with the various problems of water utilization. The problems of water use were soon overshadowed, however, by the entrance of the United States into the World War, and this Commission was not appointed. In 1920 another attempt was made to achieve a greater degree of coordination in the use of water in the Federal Water Power Act. The provisions for comprehensive development of river systems contained in this act anticipated not only the realization of the full potential power of the river, but also the coordination of power development with navigation, irrigation, recreation, and storage for domestic water supply. These provisions were entirely inadequate, however, and the Federal Power Commission was not the proper administrative agency, to effect coordinated use and development of water resources. Water power development continued to be treated primarily as a separate use of water.

In 1928 the Government was forced, by a combination of tech-

nological, economic and political factors, to adopt the Boulder Canyon project, which was the first step in the direction of coordinated development of the river. The combined project includes flood control, storage for irrigation and domestic water supply, silt regulation, and power development. Many errors were made, however, in public policy in connection with this project. In 1933 the Government inaugerated the policy, in the Tennessee Valley Authority Act, of developing a river system in its entirety under the jurisdiction of a public corporation, taking into consideration all aspects of water utilization. Care was taken in the determination of policy to avoid the difficulties and errors of the Boulder project, although the Authority was not given sufficient power to enforce certain aspects of a coordinated program for the development of the Tennessee Valley.

Recent studies which have been made by Federal and State agencies and the experience of the Tennessee Valley Authority reveal that the development of a river necessitates not only the consideration of all aspects of water utilization -- including navigation, irrigation, flood control, power development, domestic and manufacturing supply, recreation, fish and wildlife preservation, and stream pollution -- but must also include a program for the proper utilization of land resources in the drainage basin and the conservation of rain water on the land. The present trend of policy with respect to water resources is, accordingly, in the direction of comprehensive planning for the utilization of land and water resources within an entire drainage area, under the supervision and control of a Federal public corporation.

This change in policy has been the result of a combination of technological and economic factors. In the first place, the use and diversion of water under the principles of the free private enterprise system and the division of jurisdiction over water resources have led to innumerable conflicts throughout each drainage basin. In the Colorado River Basin, the State of Arizona is determined to use all available means of preventing further use of Colorado River water in California, regardless of the relative merits of water development projects in California as compared with those in Arizona. On the other hand, all of the States in the Basin object to diversion of the water to the Great Basin or the Arkansas River watershed where there is a scarcity of water to meet even existing needs. Idaho vigorously objected to the use of lakes within its boundaries as storage reservoirs for an irrigation project in Washington. The irrigation districts and Federal irrigation projects in the Western States have been unanimously opposed to the construction of new projects in the same drainage basin for fear of future water shortage. For the same reason, they have opposed power developments. The proposals of New York City to store and divert water on the upper Delaware River immediately met opposition from cities in New Jersey and Pennsylvania who were also contemplating the use of Delaware River water. Excessive pumping of underground supplies in the Central Valley led to the incursion of sea water in the delta region which destroyed the quality of the water for domestic, manufacturing or irrigation purposes. The drainage of wet lands, timber cutting and crop cultivation in certain sections of the drainage basin have materially increased the danger of floods in other sections. The discharge of water from local flood control projects may lead to a

greater flood menace downstream. In the heavily populated and industrial sections of the country serious conflicts have arisen between those municipalities and industries which are dumping raw sewage and industrial wastes in the river, and the municipalities and industries further downstream which use the water for domestic and manufacturing purposes. With a growth in population and industrial development these conflicts will necessarily increase. If attention is limited solely to these conflicts among the various water users, it is apparent that some central agency is necessary to direct the use of water for all purposes in a drainage basin and resolve such conflicts.

Looking at the problem of water utilization from a broad, social viewpoint, however, many other factors are apparent which necessitate a change in policy. The unrestricted and uncoordinated use of land and water resources has resulted in such a rapid destruction of soil by erosion and loss of fertility, the disruption of the balance between soil and water, and the waste of water resources, that a comprehensive plan for the use of these resources must be adopted by the Federal Government in the interests of self-preservation and social welfare. The direction of land use by private individuals in accordance with the profit motive has led to a very rapid rate of soil erosion. This, in turn, has stimulated and been accompanied by a steadily increasing flood menace; the lowering of surface water levels and the groundwater table; the gradual destruction of an enormous investment in dams, navigation improvements, and water purification works. Floods have continued to cause heavy annual losses throughout the country. Such flood waters have not been stored for future beneficial use -- for irrigation, stream regulation for navi-

gation, power, recreation, domestic or manufacturing supply -- because the advantages of such storage could be realized only by coordination of many different interests in the drainage basin. Such coordination cannot be achieved in a competitive, individual society. Uncoordinated development of power sites has led to the realization of but a small part of the potential power of a river system. The haphazard appropriation of water for irrigation, power, and domestic supply, has led to a waste of water resources. The use of river systems as a dumping place for wastes and sewage has necessitated heavy expenditures for purification works, resulted in large financial losses, destroyed the recreational possibilities of the river, and led to a rapid depletion of fish and wildlife.

Under a program of systematic and unified planning for the use of water and land resources in a drainage basin, these social losses could be minimized, the water resources of the region more fully utilized, and the productivity of soil conserved for the use of future generations. Such regional planning involves the coordination of all uses of water, including domestic and manufacturing supply, navigation, power, irrigation, and recreation; the interconnection of all hydro and steam power plants in the region; the coordination of waterways with railroads; the conservation of water; the prevention of floods and/excessive stream pollution; the classification of land to direct it to the most beneficial social use; the supervision and direction of land use to maintain soil fertility and prevent soil erosion; the withdrawal of submarginal lands from cultivation; resettlement of part of the population; and the direction of industrial location and development.

In the formulation of such a policy for the coordination and utilization of land and water resources, many obstacles and difficulties will be encountered which will necessitate the following fundamental changes:

1) Many basic beliefs of the people, which are deeply imbedded in American institutions, must be discarded insofar as water and land resources are concerned. These obstructive mental patterns are as follows: individual and social good are identical; free competition will coordinate industry and agriculture and the interests of producers and society; individuals must make their own adjustments; the rights and privileges of property are sacred; science alone conquers the forces of nature; natural resources are inexhaustible; markets will expand indefinitely; the Government must not compete with private industry in any way; and that governmental restriction over the economic system should be kept at a minimum. These individualistic assumptions, although having played an important role in the industrial development of the nation, are not applicable to the use of these basic natural resources. Thought patterns must be revised in order to have the proper environment for achievement of a comprehensive program of land and water use. A widespread educational program will be necessary for it is certain that economic and political interests who oppose such planning will keep these outmoded illusions before the people. Without the support of public opinion, a complete program for unified development and control of water and land resources cannot succeed.

2) Jurisdiction over all waterways should be vested in the Federal Government. The present arrangement, whereby Federal control is limited to navigation and the States supervise all other uses and

diversions of water, is unsatisfactory. In most instances, the drainage basin includes portions of two or more States. In order to secure proper control of pollution, the diversion of water for irrigation, the construction of dams on non-navigable streams, the protection of recreational facilities and the preservation of fish and wildlife, the entire river system must be under the supervision of one public agency. Past experience with the interstate compact method, in the Colorado, Columbia and Delaware watersheds, has proven that the States cannot cooperate and allocate the water to its most beneficial uses in the drainage area. Selfish interests and jealousy of each other has effectively blocked any agreement between the States. Inasmuch as they have been unable to agree even on the matter of allocating the use of water, there is no possibility that by interstate agreement an effective plan for unified development of a region could be realized. The responsibility for the operation of the plan of development is placed, therefore, on the Federal Government. Such responsibility must be accompanied by adequate and direct control over all aspects of water utilization in the drainage basin. Moreover, if the Federal Government is to assume responsibility for flood prevention, it should have control over the use of overflow lands.

A constitutional amendment may be necessary to invest adequate authority over water resources in the Federal Government. This is, of course, a highly debatable issue which has not been considered in any detail in this study. The past decisions of the Supreme Court in cases which have arisen in connection with Federal irrigation, flood control and power policy indicate that the power of the Federal Government to control the use of waterways under the commerce

clause and the regulation of the public domain are very wide. It is questionable, however, whether such power, even under the interpretation of a liberal Court, will be sufficient to allow the Federal Government to overrule the States as to diversions of water, the control of stream pollution, flood control on non-navigable streams (especially if local interests are required to contribute a part of the cost of such projects) or the development of power by the Government wherever it is deemed expedient in connection with water development projects. Past experience has shown that all opposing interests will use the arguments of unconstitutionality and invasion of States' rights, which may delay legislation and result in compromise measures. A constitutional amendment, definitely granting jurisdiction over water resources to the Federal Government would simplify the task of coordinating the uses of water and development of a river system by removing the present element of uncertainty as to the rights of the Government. Under present conditions, any extension of Federal activity in controlling water utilization will probably necessitate involved litigation to establish the authority of the Government.

3) Fundamental changes will be required in the institution of private property. With the ideal of public welfare, the maintenance of soil fertility, and the conservation of land resources, the old ideas of property rights must give way to the concept of trusteeship. An owner cannot be allowed to misuse and destroy land. If he refuses to use his land in such a manner as will coincide with the public interest, society must have the right to compel him to change his usage or take the land away from him. Before such drastic changes in property rights are effected, however, major readjustments

in agrarian economy are necessary as to the size of farm holdings, farm tenancy, and farm indebtedness. Land which is not suitable for crop cultivation must be withdrawn from use, and a part of the farm population resettled on other lands.

4) In order to make a land use program effective, both Federal and State jurisdiction will have to be greatly increased. Constitutional difficulties can be anticipated in this regard, and an amendment may be necessary to dispossess property of some of the rights with which it has been endowed by judicial interpretation of the Constitution and the common law. Either the Federal Government, the States or local subdivisions thereof (such as the soil conservancy districts proposed by the Soil Conservation Service) must have adequate authority to enforce proper methods of cultivation and grazing, the withdrawal of lands from cultivation, and the allocation of all lands to their most beneficial social use, and the supervision of all drainage, reclamation and irrigation projects. At the present time, the success of a land use program is dependent on the willingness of the private landowners to cooperate, on the control over public holdings, and on the purchase of land. It cannot be expected that all private landowners (or their tenants) will be willing to cooperate, and a land purchase program sufficient to direct and control the use of land throughout the country would be a very costly program. Moreover, in most cases public ownership of land is probably unnecessary to achieve the desired results. A curtailment of the rights of property will be sufficient to conserve water on the land and prevent excessive erosion. Effective control must, however, be lodged with some appropriate government agency to establish and enforce standards of land utilization.

5) Inasmuch as the drainage area of a river system does not coincide with state boundaries, or the local subdivisions thereof, and the states have demonstrated their inability to deal with the problem of water utilization, the proper administrative agency is the Federal public corporation. Such an agency can be removed from political influences, and it has the security and flexibility of a private business corporation. Through this public corporation, the activities of all other Federal and State agencies dealing with the problems of water and land utilization can be coordinated and unified.

6) The problem of allocation of costs of multiple-purpose projects needs careful consideration and the formulation of a definite policy with regard thereto. A very arbitrary allocation has been made of the costs of the projects on the Tennessee and St. Lawrence Rivers which is open to criticism for its failure to recognize all elements of water utilization and certain social aspects of the projects. At Boulder, however, there is no allocation whatsoever of the costs of the multiple-purpose project. Power is to carry the full burden of the joint costs and yield a surplus for additional projects on the river. In the Central Valley power revenues are expected to cover the costs of many aspects of water control and utilization. And according to the plans of the Reclamation Bureau, the power revenues from the Grand Coulee plant are expected not only to amortize the full cost of the power facilities, dam, and reservoir; but, in addition, to bear half of the cost of the irrigation project. The Reclamation Bureau has consistently upheld the policy of deriving the maximum profit from the sale of power from Federal multiple-purpose projects in order to liquidate the investment in

the development of waterways and yield a substantial surplus to the Government.

Such a policy is based on the assumption, derived from commercial economy that liquidation of the investment and the ability to show a profit from the undertaking is always desirable. Such an assumption cannot be applied to these projects for development of water resources undertaken by the Federal Government in the general interests of society. A multiple-purpose project such as the Ft. Peck reservoir, for example, which provides for navigation, flood control, irrigation, power development, recreation, and improvement of the pollution situation and public water supplies by increase of the low-water flow, confers benefits which are national in scope as well as local; some which are direct and vendible, and others are indirect. The intangible as well as the tangible benefits must be recognized. The change in economic and social conditions over a period of years in the region will also alter the relative importance of these benefits. The principles of cost accounting as derived by private commercial enterprise are not applicable to such a project for it is a social institution which finds no counterpart in the individualistic, competitive system.

7) Closely connected with the problem of cost allocation is that of power policy. Recent studies and proposed legislation indicate that the trend of policy is to promote the widespread use of electricity and lower the rates to the small consumer and the farmer. Such a policy is impossible, however, if the burden of cost is placed on power consumers. It is necessary, therefore, that future power policy be clearly defined. Many difficult problems will arise in the formulation of policy. If the power is sold to private utilities,

for example, how can the contract be drawn to protect the small consumers and yet allow flexibility of rate structures? Which class of consumers shall receive the benefits of cheap power production? What is the proper territorial allocation for rate reductions? Shall there be a general reduction throughout the transmission region or only to those consumers using the public-generated power? How can it be determined whether the full savings have been passed on to the consumers? Should the existing rate schedules throughout the region be used as a basis against which to apply the reductions? Should a special effort be made to encourage rural electrification -- to the extent of discriminating in favor of this group? These are but a few of the questions which will necessarily arise in the formulation of power policy.

The most difficult problem with respect to the distribution of power from these projects for water development, however, is the need for an interconnected grid system which will coordinate all public and private agencies within a given region. At the present time, neither the State regulatory commissions or agencies of the Federal Government have adequate authority to compel the coordination of facilities, to operate a unified grid system, or to direct the construction of new facilities. On the other hand, the private utilities have been very hostile toward such suggestions, and have shown no intention of cooperating with public authorities on terms which are acceptable by the Government. To achieve the ideal of the most economical and efficient production and distribution of power, therefore, the appropriate public agencies must be given adequate control over the industry to compel cooperation. If such regulation proves to be ineffective, public ownership of the industry is the only solution to

the problem.

8) The same general conclusions can be drawn with respect to water transportation. If the maximum benefits are to be realized from the improvement of navigable rivers by the Federal Government, water transportation should be coordinated with the railroads.

9) Changes are necessary in respect to irrigation policy, to give the Reclamation Bureau adequate authority over privately-owned lands within the projects, to extend financial assistance to the settlers, and to direct the agricultural development of the projects.

10) A definite policy should be formulated with respect to payments to the States from Federal projects which involve power production. In the Boulder project, the payment is based on the surplus power revenues, the income above the annual amount required for amortization. In the Tennessee Valley, the States receive five per cent of the gross annual income. Some of the recent proposed legislation have provided for payments as high as ten per cent of the gross revenues. The States will, of course, want as large a share of the revenue as they can get. There should be, therefore, a definite policy in this regard. Insofar as these payments are to come out of power revenues, the suggestion of the National Resources Board that such payments to the States and local subdivisions vary with the amount of power sold within the region receiving such payments would appear to have merit. Such a basis for payments would stimulate the cooperation of the political units to promote widespread use of the power.

11) Regardless of the legislation which may be enacted by the Federal Government to control the use of land and water resources or the public works projects which may be constructed to realize more

fully the benefits of water resources, however, a program such as has been indicated in the preceding study cannot be fully achieved without the cooperation of States, municipalities and individuals. The keynote of planning for the comprehensive development of river systems, for the proper utilization of land, and for the improvement of economic and social conditions of the people in the region is cooperation.

At the present time, there is no definite national policy with respect to this whole problem of water and land resources. The implications and problems of proper utilization and conservation of these resources have been recognized by various governmental agencies, however, and a start has been made in the direction of coordination of the various uses of water and conservation of land resources through the recent activities of the Public Works Administration, the Soil Conservation Service, the Rural Electrification Administration, the Resettlement Administration, the Forest Service, the Federal Power Commission and the Tennessee Valley Authority. The opposition of private and political interests may delay the formulation of a definite national policy for some time and lead to compromise measures. The present indications are, nevertheless, that, under the combined influences of technological and economic forces, future national policy with respect to water resources will be in the direction of regional planning by drainage basins for the coordinated development of all aspects of water utilization, and the supervision and control of land use, under the jurisdiction of a central Federal corporation, to conserve these resources as well as to utilize them more fully and to promote the general economic and social well-being of the people living in the region.

APPENDICES

APPENDIX A.

The Newlands Bill.[1]

A bill to create a waterways commission and a board of river regulation to promote interstate commerce by the development and improvement of the rivers and waterways and water resources of the United States and the coordination and cooperation between rail and water routes, and by providing a fund for the regulation and control of the flow of rivers and for the maintenance at all seasons of a navigable stage of water in waterways and for the connection of rivers and waterways with the Great Lakes and with each other, and as a means to that end to provide for flood prevention and protection and for water storage and for the beneficial use of flood waters for irrigation and for water power, and for the conservation and use of water in agriculture, and for the protection of watersheds from denudation and erosion and from forest fires, and for the cooperation in such works of Government services and bureaus with each other, and with States, municipalities and other local agencies.

Be it enacted . . . . That the sum of $60,000,000 annually for each of the ten years following the first day of July, 1913, is hereby reserved, set aside and appropriated, and made available until expended, out of any moneys not otherwise appropriated, as a special fund in the Treasury to be known as the river regulation fund, to be used to promote interstate commerce, by the development and improvement of the rivers and waterways of the United States and their connection with the Great Lakes and with each other, and by the coordination of a cooperation between rail and water routes and transportation, and the establishment and maintenance of adequate terminal and transfer facilities and systems and their maintenance, and improvement and protection, and by the making of examinations and surveys and by the construction of engineering and other works and projects for the regulation and control of the flow of rivers and their tributaries and source streams, and the standardization of such flow, and by the maintenance of navigable stages of water at all seasons of the year in the waterways of the United States, and by preventing silt and sedimentary materials from being carried into and deposited in waterways, channels and harbors, and by the conservation, development and utilization of the water through the establishment, construction and maintenance of natural and artificial reservoirs for water storage and control, and the protection of watersheds from denudation, erosion and surface wash, and from forest fires, and the maintenance and extension of woodland and other protective cover thereon, and the reclamation of swamp and overflow lands and arid lands, and the building of drainage and irrigation works in order that the flow of rivers shall be regulated and controlled not only through the use of flood waters for irrigation on the upper tributaries, but also through controlling them in fixed channels and established channels in the lower valleys and plains, and by doing all things necessary to provide for any and all beneficial uses of water that will contribute to its conservation or storage in the ground or in surface reservoirs as an aid to

1. S. 2739, 63d Cong., 1st sess.

the regulation or control of the flow of rivers, and by acquiring, holding, using, and transferring lands and other properties that may be needed for the aforesaid purposes, and by doing such other things as may be specified in this act or necessary to the accomplishment of the purposes thereof, and by securing the cooperation therein of States, municipalities and other local agencies, and hereinafter set forth; and for the payment of all expenditures provided for in this act; the ultimate purpose of this act being the maintenance at all times of a navigable stage of water in all inland waterways, and flood prevention and protection, and river regulation and the control of the volume of water forming the stage of the river from its source, so as to standardize the river flow, as contradistinguished from and supplemental to channel improvement as heretofore undertaken and provided for under the various acts commonly known as river and harbor acts.

Creation of the Waterways Commission and the Board of River Regulation.

Sec. 2. That a commission is hereby created, to be known as the waterways commission, consisting of the President of the United States, who shall be the chairman of such commission, with the power of veto, the Secretary of War, the Secretary of Agriculture, the Secretary of the Interior, and the chairman of the board of river regulation, to be appointed as hereinafter provided. The chairman of the Interstate Commerce Commission and the Chairman of the Panama Canal Commission shall be ex officio advisory members of said waterways commission.

The waterways commission shall have authority to direct and control all proceedings and operations and all things done or to be done under this act, and to establish all rules and regulations which may in their judgment be necessary to carry into effect such direction and control consistent with the provisions of this act and with existing law and with any provisions which Congress may from time to time enact.

All plans and estimates prepared by the board of river regulation, as hereinafter provided, which contemplate or provide for expenditures from the river regulation fund, shall be submitted to the waterways commission for final approval before any of the expenditures therein provided for or contemplated are authorized or made, or any construction work undertaken or contracts let under or in pursuance of such plans; Provided, That in case of an emergency the chairman of the board of river regulation shall have full power to act, and shall report in detail his action in every case to the waterways commission at its next meeting.

The members of said commission shall serve as such only during their incumbency in their respective official positions, and any vacancy in the commission shall be filled in the same manner as the original appointment.

A board is hereby created to be known as the board of river regulation, consisting of the Chief of Engineers of the United States Army, the chairman of the Mississippi River Commission, the Director of the United States Geological Survey, the Director of the Reclamation Service, the Forester of the Department of Agriculture, the Chief of the Bureau of Plant Industry of the Department of Agriculture, the Secretary of the Smithsonian Institute, one civil engineer,

one sanitary engineer, one hydroelectric engineer, one expert in transportation, and a chairman of the board. The last five shall be appointed by the President and hold office at his pleasure.

. . . . . .

The waterways commission may, if at any time it shall be in their judgment advisable, appoint from the public service additional members of the board of river regulation; and they shall also create and appoint from the public service the members of subordinate boards or commissions to promote the purposes of this act and expedite and facilitate the administration thereof, and operations and constructions thereunder.

Cooperation with States, Municipalities and Other Agencies.

Sec. 3. That the board of river regulation shall, in all cases where possible and practicable, encourage, promote and endeavor to secure, the cooperation of States, municipalities, public and quasi-public corporations, towns, counties, districts, communities, persons and associations in the carrying out of the purposes and objects of this act, and in making the investigations and doing all coordinative and constructive work provided for herein; and it shall in every case endeavor to secure the financial cooperation of States and of such local authorities, agencies, and organizations to an extent at least equal in amount to the sum expended by the United States; and it shall negotiate and perfect arrangements and plans for the apportionment of work, cost, and benefits, according to the jurisdictions, powers, rights and benefits of each, respectively, and with a view to assigning to the United States such portion of such development, promotion, regulation and control as can be promptly undertaken by the United States by virtue of its power to regulate interstate and foreign commerce and promote the general welfare, and by reason of its proprietary interest in the public domain, and to the States, municipalities, communities, corporations, and individuals such portion as properly belongs to their jurisdiction, rights and interests, and with a view to properly apportioning the costs and benefits, and with a view to so uniting the plans and works of the United States within its jurisdiction, and of the States and municipalities respectively within their jurisdiction, and of corporations, communities and individuals within their respective rights and powers, as to secure the highest development and utilization of the waterways and water resources of the United States.

Encouragement of Independent Initiative and Construction.

Sec. 4. That all things done under this act shall be done with a view not only to constructive cooperation but also with the definite and specific object of enlarging the field of accomplishment contemplated by the act through promoting and encouraging independent initiative and construction by States, municipalities, districts and other local agencies and organizations, and creating object lessons and building models and making demonstrations that will have that effect and influence and induce such supplemental and independent action and construction.

Conference and Cooperation of Bureaus and States.

Sec. 5. That it shall be the duty of the board to coordinate and bring into conference and cooperation the various scientific and constructive bureaus of the United States with each other and with the representatives of States, municipalities, towns, counties, public and quasi-public corporations, communities and associations, and of foreign nations or international streams, in the carrying out and accomplishment of the provisions of this act.

The board shall also have authority to call upon and to bring into cooperation any other Federal department or bureau whose investigations or assistance may be found necessary to the carrying out of the provisions of this act.

Correlation, Coordination and Administrative Economy.

Sec. 6. That the board shall harmonize and unify and bring into correlation and coordination in the investigations made, and information, data and facts collected and obtained by the various bureaus or offices of the Government relating to or connected with the matters and subjects referred to and the questions involved in this act, and to print, publish, and disseminate the same, and it shall exercise such general supervision as may be necessary to avoid duplication of effort in connection therewith.

. . . . . .

Reports, Plans and Estimates of the Board.

Sec. 7. The board shall obtain full information as to all proposed expenditures for purposes within the scope of this act. The findings and conclusions of the board and plans for construction and action adopted by this agency shall be binding upon the various departments and services therein represented.

References to and Instructions from the President.

Sec. 8. All conflicts which may arise between the various departments or services concerned with water resources shall be referred to the President, who, in conjunction with the waterways commission, shall settle and decide the question.

Comprehensive Plans for River Regulation.

Sec. 10. That the board of river regulation shall develop, formulate prepare, consider, and determine upon comprehensive plans for the conservation, use and development of the water and forest resources of the United States in such manner as will best regulate the flow of rivers and their tributaries and source streams, and the stage of water in inland waterways, and the confinement of all other rivers and waterways at all times within fixed and established channels, and embracing, with that object, the construction of levees, and revetments and all works necessary for the fixation of channels and flood protection, drainage, and the reclamation of swamp and overflow land; water storage in natural and artificial reservoirs; the beneficial use of waters for irrigation, and for municipal, domestic, and industrial purposes; the maintenance and development of under-

ground water supplies and the storage of water in the ground and in irrigated lands and the underground reservoirs; the enlargement of the areas and the raising of the levels of the ground waters; the conservation of ground waters; the construction of flood-water canals, by-passes, and restraining dams; the control and regulation of drainage; the perpetuation of forests and maintenance of woodland cover as sources of stream flow; the prevention of denudation and erosion; the protection of channels and harbors from eroded soil materials; the clarification of streams; the utilization of water power; the prevention of pollution of streams and rivers; the sanitary disposal of sewage and purification of water supplies; the best distribution of forests, woodlands, and other growth, and of cultivated and irrigated areas in their relation to river flow; the protection of forested and woodland areas from forest fires; the reforestation of denuded areas; the planting of forests and establishment of forest plantations; the making and furnishing of plans for flood-water storage and other works for irrigation and power for farms, towns, and villages; the acquisition, subdivision and settlement in small, intensively cultivated farms of lands for water storage by irrigation; the building of the irrigation systems for such lands; the protection of farms, villages, towns and municipalities from damage by overflow, and the impounding of flood waters -- artificial lakes and storage reservoirs to prevent floods and overflow; erosion of banks, and breaks in levees, and to regulate the flow of streams and reenforce such flow during drought and low-water periods, the ultimate object of all such work being to regulate and so far as possible, standardize the flow of rivers and their tributaries and source streams, and in the accomplishment of that object to induce and secure the cooperation of States, municipalities, and other local agencies and organizations.

(The remaining provisions of the bill relate to the specific duties of the various Federal agencies, the apportionment of appropriations among these administrative bodies, and the equitable apportionment among the waterway systems.)

APPENDIX B.

THE WATERWAYS COMMISSION[1]

That a commission, to be known as the Waterways Commission, consisting of seven members to be appointed by the President of the United States, at least one of whom shall be chosen from the active or retired list of the Engineers Corps of the Army, at least one of whom shall be an expert hydraulic engineer from civil life, and the remaining five of whom may each be selected either from civil life or the public service, is hereby created and authorized, under such rules and regulations as the President may prescribe, and subject to the approval of the heads of the several executive departments concerned, to bring into coordination and cooperation the engineering, scientific, and constructive services, bureaus, boards, and commissions of the several governmental departments of the United States and commissions created by Congress that relate to study, development, or control of waterways and water resources and subjects related thereto, or to the development and regulation of interstate and foreign commerce, with a view to uniting such services in investigating, with respect to all watersheds in the United States, questions relating to the development, improvement, regulation, and control of navigation as a part of interstate and foreign commerce, including therein the related questions of irrigation, drainage, forestry, arid and swamp land reclamation, clarification of streams, regulation of flow, control of floods, utilization of water power, prevention of soil erosion and waste, storage, and conservation of water for agricultural, industrial, municipal, and domestic uses, cooperation of railways and waterways, and promotion of terminal and transfer facilities, to secure the necessary data, and to formulate and report to Congress, as early as practicable, a comprehensive plan or plans for the development of waterways and the water resources of the United States for the purposes of navigation and for every useful purpose, and recommendations for the modification or discontinuance of any project herein or heretofore adopted. Any member appointed from the retired list shall receive the same pay and allowances as he would if on the active list, and no member selected from the public service shall receive additional compensation for services on said commission, and members selected from civil life shall receive compensation of $7,500 per annum.

In all matters done, or to be done, under this section relating to any of the subjects, investigations, or questions to be considered hereunder, and in formulating plans, and in the preparation of a report or reports, as herein provided, consideration shall be given to all matters which are to be undertaken, either independently by the United States or by cooperation between the United States and the several States, political subdivisions thereof, municipalities, communities, corporations, and individuals within the jurisdiction, powers, and rights of each, respectively, and with a view to assigning to the United States, and to the States, political subdivisions thereof, municipalities, communities, corporations, and individuals such portions as belong to their respective jurisdictions, rights,

1. River and Harbor Act of 1917, 40 Stat. 250, sec. 18.

and interests.

The commission is authorized to employ, or retain, and fix the compensation for the services of such engineers, transportation experts, experts in water development and utilization, and constructors of eminence as it may deem necessary to make such investigations and to carry out the purposes of this section. And in order to defray the expenses made necessary by the provisions of this section there is hereby authorized to be appropriated such sums as Congress may hereafter determine, and the sum of $100,000 is hereby appropriated, available until expenses, to be paid out upon warrants drawn on the Secretary of the Treasury by the chairman of said commission.

APPENDIX C.

The bill introduced by Representative O'Conner in 1927 provided for the creation of a waterways and water resources commission, to consist of a chairman, the Secretaries of War, Interior and Agriculture, a member from the Senate and the House of Representatives, and an economist and expert in matters relating to waterways and water resources as they affect agriculture, commercial and industrial development.[1] This commission was to utilize the various agencies of the government in carrying out the purposes of the bill. Rules and regulations were to be drawn up to bring into coordination and cooperation the engineering, scientific, and constructive services, bureaus, boards and commissions of the Government. To facilitate such cooperation, a water control board was to be created, consisting of the chairman of the waterways commission, an Army engineer, an hydraulic engineer and an hydroelectrical engineer.

The commission was to study questions relating to the development, improvement, regulation, and control of navigation as a part of interstate and foreign commerce. These studies would include the related questions of irrigation, drainage, forestry, arid and swamp land, reclamation, clarification of streams, regulation of flow, control of floods, utilization of water power, prevention of soil erosion and waste, storage and conservation of water for agricultural, industrial, municipal, and domestic uses, cooperation of railways and waterways and promotion of terminal and transfer facilities.

In discussing this bill before the House, Representative O'Conner made the following statement:

H. R. 5025, The Enactment of Which Will Solve Major National Problems.[2]

Mr. Speaker, nothing can happen until the appointed hour arrives for it to happen. The children of the men who are now living and that must play out their part in the grand drama of life a thousand years hence are just as surely in the coming as the magnificant statuary that is to adorn the future. The great and the small, the intellectual and the poorly-equipped, who are to strut across the stage of life in the far-away future are potentialities now awaiting the coming and the passing of the human vehicles that will link themselves up and form the chain that will reach into the remote ends of time and touch every generation through its connections while man lasts upon this earth. The marble queen of thought, the silent figure of the martial hero of conflicts that are to be fought centuries ahead of us, the granite effigy of that philosopher who will dream dreams that are not and cannot now be known to the minds of men living, the rock likeness of the past whose music will be grander, loftier, higher, and more inspiring because of the broadened vision

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1. H. R. 5025, 69th Cong., 2d sess.
2. Congressional Record, Vol. 68, Part 5, p. 5678.

coming from the wonders that will be performed between now and his day are there in the quarries awaiting the chisel of the sculptors. Aye, the poet and his statue are side by side in the ground, and each will perform its mission in the eons that are to come and there will join those things that will have passed away.

Those that have been dead a thousand years and those that are to live a thousand years from now on are both in the bosom of Mother Earch. Nothing can happen until the appointed time for it to happen is a truism that has been a consolation to the philosopher and the prophets of the past and will continue to support the dreamers of the future, who will willinging suffer and moil for the vindication of the truths which they preach, even though that vindication lie in the remote future, invisible except to the inner eye of the prophet, who knows that coming events cast their shadows before. "A dreamer lives forever and a toiler dies in a day."

There are many men and women who agonize through the years in which they are ordained to play out a part, apparently without any flower in its branches or sunshine in its setting. There are among our countrymen a few men who have justified their splendid existences, though they may know it not, in endeavoring to crystallize a national sentiment which will make for the formulation and adoption of a national policy in respect to the utilization and conservation of our water resources. As a result of this determination, I introduced a bill in the first session of the Sixty-Ninth Congress. It is known as House bill 5025. It was referred to the Committee on Flood Control and ordered to be printed. For a while nothing was heard from the people about this proposed measure. In an humble way I endeavored to attract the attention of my countrymen to it. The National Flood Control Association proclaimed its virtues from one end of our land to another. Slowly but surely this bill, which was thought to be doomed to the graveyard that inevitably awaits so many bills that are introduced into the House and Senate, began to attract the attention of clear and resolute thinkers who know that our waterways when properly developed will be our country's greatest asset.

In the way of power development water will create that clink of machinery which is sweet music to the ears of the industrial workers of the land. Waterways will make, when properly studies and controlled along the lines of H. R. 5025 for irrigation so that the desert will rejoice and blossom as the rose. Reclamation through that bill willbring to our submerged lands a fertility that will pale into insignificance the wonders of the soil of Belgium and Holland. When enacted into law, H. R. 5025 will make for flood control, which will insure a navigable stream of waterways flowing through 12,000 miles of the richest part of our territory, making for a low cost transportation system that will not only maintain our industrial supremacy at home but will renew our agricultural prosperity, which is, after all, the basis of all wealth. Mining so so near to agriculture as to be a twin sister. I have committee myself to the fight for the vindication and accomplishment of the great purpose that has sprung from the brain of men who care not for publicity nor crave the glory that goes for a brief moment with the

spot light. I have seen the bill which I thought might go through its congressional existence as a straggler and fugitive grow unto giant proportions. It is today discussed by engineers, managers of the associations of commerce, and leaders of public thought as the great boon that will assure permanency in the industrial, commercial, financial, and economic life of the Nation. "I care not who write the laws of a country if you permit me to write its songs", said Fletcher. I might say as evidence of my appreciation of what will flow from the enactment of my bill into law and its operation that I care not who write the laws or the ordinary songs of the people if you permit me to enact this bill. From that operation will spring such a vast prosperity, such a chug of barge and steamboat paddles, wheels and propellers, such a rolling whir of trucks and busses on our roads, such a revolution of railroad wheels, such a commercial roar as to make for new laws and new songs that will charm the ear, satisfy the mind and delight the American heart. For all phases of our national life and industry must grow with a waterway development as planned under H. R. 5025, even as the limbs, branches, and flowers of a tree like the magnolia grow and blossom and bloom as the trunk expands in power and strength."

APPENDIX D.

Government Dams

Dam	Purpose	Cost
Wilson, Ala.[a]	Navigation, power	$46,950,000
Norris, Tenn.[a]	Storage, power	36,000,000
Wheeler, Ala.[a]	Navigation, power, flood	33,800,000
Pickwick Landing, Tenn.[b]	Navigation, flood	26,700,000
Guntersville, Ala.[c]	Navigation, flood	29,400,000
Chickamauga, Tenn.[c]	Navigation, flood	31,600,000
Grand Coulee, Wash.[b]	Flood, irrigation, power	180,000,000
Boulder, Ariz.-Nev.[a]	Flood, irrigation, power	125,000,000
Friant, Calif.[c]	Irrigation, power	15,000,000
Kennett, Calif.[c]	Flood, irrigation, power	75,000,000
Keswick, Calif.[c]	Flood, irrigation, power	7,000,000
Seminoe, Wyom.[b]	Flood, irrigation, power	8,500,000
Parker, Ariz.-Calif.[b]	Water supply, power	8,805,000
Roosevelt, Ariz.[a]	Irrigation, power	3,890,000
Ft. Peck, Mont.[b]	Flood, irrrigation, power, navigation	86,000,000
Conchas, N.Mex.[b]	Flood, water supply	9,000,000
Bonneville, Ore.-Wash.[b]	Navigation, power	31,000,000
Passamaguoddy, Me.[b]	Tidal power	37,732,000
Coolidge, Ariz.[a]	Flood, power	4,500,000
Tygart R., W. Vir.[b]	Navigation, flood	15,000,000
Sardis, Miss.[c]	Flood	9,000,000
Muskingum, Ohio[b]	Flood	23,000,000
Passum Kingdom, Tex.[b]	Flood, conservation	3,000,000
Shoshone, Wyom.[a]	Irrigation, power	1,500,000
Owyhee, Ore.[a]	Irrigation	5,400,000
Arrow Rock, Ida.[a]	Irrigation	4,300,000
Elephant Butte, N.Mex.[a]	Irrigation	4,100,000
Pathfinder, Ida.[a]	Irrigation	1,800,000
Horse Mesa, Ariz.[a]	Power	2,873,000
Morman Flat, Ariz.[a]	Power	1,559,000
Stewart Mt., Ariz.[a]	Power	2,515,000
Alcova, Wyom.[b]	Irrigation	3,339,000
Teiton, Wash.[a]	Irrigation	3,756,000
McKay, Ore.[a]	Irrigation	3,124,000
Bellefourche, S.Dak.[a]	Irrigation	1,230,000
Alamagorda, N.Mex.[b]	Irrigation	3,465,000
Taylor Park, Colo.[b]	Irrigation	2,000,000

[a] Completed.
[b] Construction under way.
[c] Preliminary work started.

Source: Chase, Stuart, Rich Land, Poor Land, McGraw Hill Book Co., 1936, p. 160.

APPENDIX E.

The Columbia Valley Authority Bill[1]

A bill to improve the navigability of the Columbia River and its tributaries; to provide for the flood control of theColumbia River and its tributaries; to provide for reforestation and the use of marginal lands in the Columbia River Basin; to provide for the agricultural and industrial development of the Columbia River Basin; to provide for the irrigation of lands in the Columbia River Basin; to provide for the development of electrical power in the Columbia River Basin; and for other purposes.

Be it enacted . . . . , That for the purpose of controlling the flood waters of the Columbia River and its tributaries, and for the purpose of the improvement of the navigability of the Columbia River and its tributaries, to provide for the irrigation of lands within the Columbia River Basin, to provide for the development of hydro-electric energy, and to improve agricultural conditions, there is hereby created a body corporate to be known as the Columbia Valley Authority. . . . .

Sec. 2. The Board of Directors of the Corporation shall be composed of three members to be appointed by the President, with the advice and consent of the Senate. . . . . All other officials, agents, and employees shall be designated and selected by the Board.

Each of the members of the board shall be a citizen of the United States and shall receive a salary at the rate of $10,000 a year. . . . .

There shall be an advisory board composed of the Pacific Northwest Regional Planning Commission, composed of the State planning boards of Idaho, Oregon, Washington, and Montana, and representatives of the Secretaries of Interior, War, Agriculture, Commerce, Labor, and of the Federal Emergency Relief Administrator.

. . . . . .

Sec. 5. Except as otherwise specifically provided in this Act, the Corporation --

(a) Shall have succession in its corporate name.

(b) May sue and be sued in its corporate name.

(c) May adopt and use a corporate seal, which shall be judicially noticed.

(d) May make contracts, as herein authorized.

(e) May adopt, amend, and repeal bylaws.

(f) May purchase or lease and hold such real estate and personal property as it deems necessary or convenient in the transaction of its business, and may dispose of any such personal property held by it.

(g) Shall have power in the name of the United States of America to exercise the right of eminent domain, and in the purchase of any real estate . . . . the title shall be taken in the name of the United States. . . .

(h) Shall have power to acquire real estate for the construction of dams, reservoirs, power houses, and other structures and navigation projects at any point along the Columbia River, or any of its tributaries. . . . .

1. H. R. 117, 75th Cong., 1st sess.

(i) Shall have power to rent, purchase, or erect transmission lines for the transmission of electricity connecting any dams, reservoirs, or power houses, and for transmitting power developed by the Corporation to the places or place of consumption.

(j) Shall have power to construct dams, reservoirs, power houses, power structures, transmission lines, navigation projects, and incidental works, in the Columbia River Basin, and to unite the various power installations into one or more systems of transmission lines, and to do any and all things necessary for the carrying out of the purposes of the Act.

Sec. 6. The Corporation is hereby authorized --

(a) To produce, transmit, distribute, and sell electric power, as herein authorized.

(b) To establish, maintain, and operate laboratories and experimental plants and to undertake experiments for the distribution of electricity to farm organizations, municipal corporations, States and public subdivisions of States, counties, or municipalities; to further the proper use, conservation, and development of the natural resources of the Columbia River Basin; and to study the question of reforestation within said basin, and the proper use of marginal lands therein. . . . .

(c) To supply water for irrigation and other purposes to States, counties, districts, municipalities, or farm organizations.

(d) To request the assistance and advice of any officer, agent, or any employee of any executive department or any independent office of the United States to enable the Corporation the better to carry out its powers and duties successfully. . . . .

Sec. 7. In the appointment of officials and the selection of employees by said Corporation, and in the promotion of any such officials or employees, no political test or qualification shall be permitted or given consideration, but all such appointments and promotions shall be given and made on the basis of merit and efficiency.

Sec. 8. The Corporation is hereby empowered and authorized to sell the surplus power not used in its operations to States, counties, municipalities, corporations, partnerships, or individuals, according to the policies herein set forth; and to carry out said authority the Corporation is authorized to enter into contracts for sale for a term not exceeding twenty years. In the sale of such current by the Corporation, it shall give preference to States, counties, municipalities, and cooperative organizations of citizens or farmers, not organized or doing business for profit, but primarily for the purpose of supplying electricity to their own citizens or members; Provided, That all contracts made with private companies or individuals for the sale of electric power, which power is to be resold at a profit, shall contain a provision authorizing the Corporation to cancel such contract upon three years' notice in writing, if the Corporation needs said electric power to supply the demands of States, counties, municipalities, or cooperative organizations of citizens or farmers.

Sec. 9. In order to promote and encourage the fullest possible use of electric light and power on farms within reasonable distance

of any of its transmission lines, the Corporation in its discretion shall have power to construct transmission lines to farms and small villages which are not otherwise supplied with electricity at reasonable rates and to make rules and regulations governing such sale and distribution of such electric power as in its judgment may be just and equitable.

The Corporation is hereby authorized and directed to make studies, experiments, and determinations to promote the wider and better use of electric power for agricultural and domestic purposes, or for small or local industries, and it may cooperate with State governments or their subdivisions or agencies, with educational or research institutions, and with cooperatives or other organizations in the application of electric power to the fuller and better-balanced development of the resources of the region.

It is hereby declared to be the policy of the Government, insofar as practicable, to distribute and sell the surplus power generated by said Corporation equitably and practically among the States, counties, municipalities, and farm organizations, as herein provided for, within reasonable transmission distance. Said policy is further declared to be that the projects herein provided for shall be considered primarily for the benefit of the people of the section as a whole and particularly the domestic and rural consumers to whom the power can economically be made available.

Sec. 10. In order to place the Corporation upon a fair basis for the making of contracts and for receiving bids for the sale of power, it is hereby expressly authorized, either from appropriations made by Congress, or from funds secured from the sale of power, to construct, lease, purchase, or authorize the construction of transmission lines within transmission distance from the place where generated. The Corporation is also authorized to lease to any person, persons, or corporation, the use of any transmission line owned by the Government and operated by the Corporation, but no such lease shall be made that in any way interferes with the use of such transmission lines by the Corporation: Provided, That if any State, county, or municipality, or other public or cooperative organization of citizens or farmers, not organized or doing business for profit, but primarily for the purpose of supplying electricity to its own citizens or members, or any two or more of such municipalities or organizations shall construct or agree to construct and maintain a properly designed and built transmission line to any generating plant owned by the Government and under the control of the Corporation, the Corporation is hereby authorized to contract with such State, county, or municipality, or other organization, or any two or more of them, for the sale of electricity for a term not exceeding thirty years; and in any case the Corporation shall give to such State, county, municipality, or other organization, ample time to fully comply with any local law now in existence, or hereafter enacted, providing for the necessity of legal authority for such State, county, municipality, or other organizations, to contract with the Corporation for such power: Provided, further, That all contracts entered into between the Corporation and any municipality or other political subdivision or cooperative organization shall provide that the electric power shall be sold and distributed to the ultimate consumer without discrimination as between con-

sumers of the same class, and such contract shall be voidable at the election of the Corporation, if a discriminatory rate, rebate, or other special concession is made or given to any consumer or used by the municipality or other political subdivision or cooperative organization: Provided, further, That as to any surplus power not so sold, as above provided, to States, counties, municipalities, or other said organizations, before the Corporation shall sell the same to any person or corporation engaged in the distribution or resale of electricity for profit, it shall require said person or corporation to agree that any resale of electric power by such person or corporation shall be made to the ultimate consumer of such electric power at prices that shall not exceed a schedule fixed by the Corporation from time to time as reasonable, just, and fair; and in case of any such sale, if an amount is charged the ultimate consumer which is in excess of the price so deemed to be just, reasonable, and fair by the Corporation, the contract for such sale between the Corporation and such distributor of electricity shall be voidable at the election of theCorporation: And provided further, That the Corporation is hereby authorized to enter into contracts with other power systems or the mutual exchange of unused excess power upon suitable terms, and as an emergency or breakdown relief.

Sec. 11. Upon its completion, the dam now being constructed by the Bureau of Reclamation on the Columbia River at Grand Coulee, Washington, together with all the works, transmission lines, and other property connected therewith shall be under the controlof the Columbia Valley Authority: Provided, That upon its completion, the dam now being constructed by the War Department on the Columbia River between Bonneville, Oregon, and North Bonneville, Washington, shall be turned over to the Columbia Valley Authority and thereafter said dam and all the works, transmission lines, and other property connected therewith shall be under the control of the Corporation, the same as all other projects herein provided for.

The Corporation shall make a thorough investigation as to the cost of said dams, and as to the cost of any dam provided for in this Act, for the purpose of ascertaining what part of the cost of said dams and other improvements shall be allocated and charged to (1) flood control, (2) navigation, (3) irrigation, and (4) power development. The findings thus made by the Corporation, when approved by the President of the United States, shall be final, and such findings shall thereafter be used in keeping the book value of said properties.

In fixing the amount which farmers or organizations of farmers, or others, shall pay for water stored by the Corporation to be used by such organizations for irrigation, no greater charge shall be made for said water than is thus allocated to irrigation. In fixing the amount thus allocated to power, no purchaser of electric current shall be charged a greater amount than will be sufficient to reimburse the Government for the expenses allocated to power. It is hereby declared to be the intention of this Act that the users of water for irrigation shall not be required to pay any part of the projects herein not allocated to irrigation, and that the users of electricity shall not be required to pay any part of said projects not allocated to power, but that the charges for water to be used for irrigation and the charges for power shall be based, respectively, upon the allocation to irrigation and power; that when the

Government has been paid in either case the entire amount expended for irrigation or for power the charges thereafter assessed against irrigation or power shall only be sufficient to pay its part of the maintenance, upkeep, and management of said projects thus allocated either to irrigation or power.

Sec. 12. The Corporation is hereby authorized to construct any plant or plants, either steam or otherwise, to be used as stand-by plants in connection with other generating plants herein provided for.

Sec. 13. The Corporation is hereby authorized and directed to construct under the terms of this Act any dam or dams which by its study and survey of the Columbia River Basin is by said Corporation deemed necessary or feasible; and it is hereby directed to construct such dam or dams as may be necessary to assist in the control of the floodwaters of the Columbia River or any of its tributaries wherever nature has provided a natural storage reservoir which can be utilized for the storage of such floodwaters. For the purpose of this Act a tributary is defined to be any stream the waters of which, in their natural course, become a part of the waters of the Columbia River. The Corporation is authorized to utilize such stored waters for the purpose of irrigation, flood control, navigation, and the development of electric power.

It shall be the duty of the Corporation by the methods and means provided for in this Act, to bring about in said Columbia River Basin, including its tributaries, (1) the maximum amount of irrigation, with particular reference to providing sufficient and adequate water rights for existing irrigation districts, associations, companies, or other organizations, (2) the maximum amount of flood control, (3) the maximum benefit to navigation, (4) the maximum generation of electric power consistent with irrigation, flood control, and navigation, (5) the proper use of marginal lands, (6) the proper method of reforestation of lands in said basin suitable for reforestation, and (7) the economic and social well-being of the people living in said basin.

The President is hereby authorized, by such means and methods as he may deem proper within the limits of appropriations made therefor, to make such surveys and general plans for said territory as may be useful to Congress, to the Corporation, and to the several States, in guiding and controlling the extent, sequence, and nature of the development that may be equitably and commercially advanced through the expenditure of public funds, and through the guidance and control of public authority, all for the general purpose of fostering an orderly and proper physical, social, and economic development of said area. The President or theCorporation is further authorized, in making such plans and surveys, to cooperate with the States affected thereby, or with subdivisions or agencies of such States, or with cooperative or other organizations, and to make such studies, experiments, or demonstrations as may be necessary or suitable to that end. He or it shall recommend to Congress from time to time, as the work provided for in this Act proceeds, such legislation as may be deemed proper to carry out the general purposes of this Act.

Sec. 14. In the construction of any future dam, steam plant, or other facility, pursuant to authority herein provided the Board is hereby authorized and empowered to issue on the credit of the United States and to sell serial bonds not exceeding $50,000,000 in amount, having a maturity not more than 50 years from the date of issue thereof, and bearing interest not exceeding 3½% per centum per annum.

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Sec. 20. All appropriations necessary to carry out the provisions of this Act are hereby authorized to be appropriated.

Sec. 21. The sections of this Act and subdivisions of sections are hereby declared to be separable, and in the event any one or more sections or parts of the same of this Act be held to be unconstitutional, the same shall not affect the validity of other sections or parts of sections of this Act.

APPENDIX F.

The Arkansas River Watershed Authority Bill[1]

A bill to provide for the control of the flood waters of the Arkansas River and its tributaries, to provide for the irrigation, agricultural development, and terracing of lands in the Arkansas River Watershed, to provide for the development of electrical power along the streams in such watershed, to provide for the reforestation of lands suitable therefor in such watershed, and to provide for the economic and social well-being of people living in the Arkansas River Watershed, and for other purposes.

Sec. 2. There is hereby created a body corporate by the name of "The Arkansas River Watershed Authority" for the purposes of erecting, maintaining, and operating dams, reservoirs, and canals to control destructive flood waters, to promote agricultural development, and to provide for the storage of waters of the Arkansas River and its tributaries and the delivery of waters so stored for irrigation and reclamation of arid and semiarid lands, of providing for the terracing of lands suitable therefor in the Arkansas River Watershed, for the reforestation of lands suitable therefor in such watershed, and for the development of electrical power along the streams of such watershed, and of aiding and improving the economic and social well-being of the people living in such watershed, and for other purposes set forth in this Act. The Arkansas River Watershed, for the purposes of this Act, shall be deemed to include the States of Oklahoma, Texas, New Mexico, Colorado, and Kansas. The first purpose of this Act shall be to control the flood waters of the Arkansas River and its tributaries, and the second purpose shall be to provide for irrigation and reclamation of arid and semiarid lands, but when these two purposes come in conflict the use of the dams and reservoirs for flood control may be subordinated to the use of said dams and reservoirs for the purpose of irrigation and reclamation of arid and semiarid lands. . . . .

Sec. 3. The board of directors of the Corporation shall exercise all the powers of the corporation. The board shall be composed of three members to be appointed by the President, by and with the advice and consent of the Senate. . . . .

Each member of the board shall be a citizen of the United States, and shall receive a salary at the rate of $12,000 a year, to be paid by the Corporation as current expenses. . . . .

Sec. 4. Except as otherwise specifically provided in this Act, the corporation --

(1) Shall have succession in its corporate name.

(2) May sue and be sued in its corporate name.

(3) May adopt and use a corporate seal, which shall be judicially noticed.

(4) May make contracts, as authorized in this Act.

(5) May adopt, amend, and repeal bylaws.

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1. H. R. 6368, 73d Cong., 2d sess.

(6) May purchase or lease and hold or dispose of such real and personal property as it deems necessary or convenient in the transaction of its business.

(7) Shall have such powers as may be necessary or appropriate for the exercise of the powers specifically conferred upon the corporation by this Act.

(8) Shall have power in the name of the United States of America to exercise the right of eminent domain for all purposes of this Act. . . . .

(9) Shall have power to construct, maintain, and operate dams, reservoirs, diversion canals, canals, irrigation works, terrace lands suitable therefor, build electrical power plants and transmission lines, acquire and reforest lands suitable therefor in the Arkansas River Watershed, and do such other things as are provided for in this Act to aid and improve the economic and social well-being of the people living in the Arkansas River Watershed area.

Sec. 5. (a) The corporation shall maintain its principal office in Oklahoma City, Oklahoma. . . . .

(b) The corporation shall at all times maintain complete and accurate books of account.

(c) The board shall file with the President and the Congress, in January of each year, a financial statement and a complete report as to the business of the corporation covering the preceding governmental fiscal year. . . . .

(d) The Comptroller General of the United States shall audit the transactions of the Corporation at such times as he shall determine, but not less frequently than once each governmental fiscal year, with personnel of his selection. . . . .

Sec. 6. The board is hereby authorized and directed --

(1) To construct by contract or otherwise, and to maintain and operate dams, reservoirs, canals, irrigation works, terraced lands, electrical power plants and transmission lines, and incidental works, to carry out the purpose of this Act.

(2) To contract for the impounding and storage of water and the delivery thereof for irrigation, municipal, and domestic uses to the States in the Arkansas River Watershed, political subdivisions and municipal corporations in any such State, and irrigation districts duly organized under the law of any such State. Contracts respecting water for irrigation, municipal, and domestic uses shall be for permanent services.

(3) To fix such charges for water for irrigation, municipal, and domestic uses as, in the opinion of the board, are fair and reasonable.

(4) To construct works at such places on the Arkansas River and its tributaries and make contracts for the delivery of water for the use of such projects as will promote a correlated system of irrigation for arid and semiarid lands in the States of the Arkansas River Watershed.

(5) To terrace such lands, as in its opinion, should be terraced in order to carry out the purposes of this Act.

(6) To construct and maintain and operate hydroelectric plants along the streams in the Arkansas River Watershed where there are suitable sites, providing there is an adequate market for the elec-

tric power so generated, and to construct and maintain electrical transmission lines for the delivery of said electric power.

(7) To contract for the sale of electric power and to fix such charges for it as, in the opinion of the board, are fair and reasonable. Contracts respecting electric power shall be for one year.

(8) To purchase or condemn lands suitable for reforestation and reforest such lands.

(9) To do such other things as are provided for in this Act to aid and improve the economic and social well-being of the people living in the Arkansas River Watershed.

. . . . . .

Sec. 9. To aid further the proper use, conservation, and development of the natural resources of the Arkansas River Watershed and of such adjoining territory as may be related to or materially affected by the development consequent to this Act, and to provide for the general welfare of the citizens of such areas, the President is hereby authorized, by such means or methods as he may deem proper within the limits of appropriations made therefor by Congress, to make such surveys of and general plans for the Arkansas River Watershed and adjoining territory as may be useful to the Congress and to the several States in guiding and controlling the extent, sequence, and nature of development that may be equitably and economically advanced through the expenditure of public funds, or through the guidance or control of public authority, all for the general purpose of fostering an orderly and proper physical, economic, and social development of such areas; and the President is further authorized in making such surveys and plans to cooperate with the States affected thereby, or subdivisions or agencies of such States, or with cooperative or other organizations, and to make such studies, experiments, or demonstrations as may be necessary and suitable to that end.

Sec. 10. The President shall, from time to time, as the work provided for in the preceding section progresses, recommend to Congress such legislation as he deems proper to carry out the general purposes stated in such section, and for the especial purpose for bringing about in the Arkansas River Watershed and adjoining territory in conformity with such general purposes: (1) The maximum amount of flood control; (2) the maximum development of irrigation projects in the Arkansas River Watershed consistent with the demand for irrigation or public use; (3) the maximum amount of terracing required to carry out the purposes of this Act; (4) the maximum generation of electric power consistent with flood control and the market demand for electric power; (5) the proper method and extent of reforestation of all lands in such watershed suitable for reforestation; and (6) the economic and social well-being of the people living in such watershed.

Sec. 11. The net proceeds derived by the board from the sale of water and any other business of the Corporation, after deducting the cost of operation, maintenance, depreciation, amortization, and an amount deemed by the board as necessary to withhold as operating capital, or devoted by the board to new construction, shall be paid into the Treasury of the United States at the end of each calendar year.

. . . . . .

Sec. 15. (a) The consent of Congress is hereby given to the States of the Arkansas River Watershed to negotiate and enter into compacts or agreements consistent with this Act for a comprehensive plan for the development of the Arkansas River and its tributaries and providing for the storage, diversion, and use of the waters of such river and its tributaries. Any such compact or agreement may provide for the construction of dams, headworks, and other diversion works or structures for flood control, reclamation, improvement of navigation, diversion of water, or other purposes and/or the construction of power houses or other structures for the development of water power and the financing of the same; and for such purposes may authorize the creation of interstate commissions and/or the creation of corporations, authorities, or other instrumentalities. Such consent is given upon condition that a representative of the United States, to be appointed by the President, shall participate in the negotiations and shall make report to Congress of the proceedings and of any compact or agreement entered into. No such compact or agreement shall be binding or obligatory upon any of such States unless and until it has been approved by the legislature of each of such States and by the Congress of the United States.

(b) The United States, its permittees, licensees, and contractees, and all users and appropriators of water stored, diverted, carried, and/or distributed by the reservoir, canals, and other works authorized in this Act, shall observe and be subject to and controlled by any compacts or agreements entered into pursuant to subsection (a) of this section in the construction, management, and operation of said reservoir, canals, and other works and the storage, diversion, delivery, and use of water for the generation of power, irrigation, and other purposes, anything in this Act to the contrary notwithstanding, and all permits, licenses, and contracts shall so provide.

Sec. 16. The right to alter, amend, or repeal any provision of this Act is hereby expressly declared and reserved, but no such alteration, amendment, or repeal, shall operate to impair the obligation of any contract made by the board or the Corporation under any power conferred by this Act.

APPENDIX G.

Arkansas, Red, and White Rivers Basin Commission Bill[1]

A bill providing for flood control, irrigation, navigation, production of electric power, regulation of soil erosion, and for other purposes, in the areas drained by the Arkansas, Red, and White Rivers.

Be it enacted. . . ., That for the purpose of regulating soil erosion, flood control, irrigation, and for the purpose of furthering navigation and the production of electric power in the areas drained by the Arkansas, Red, and White Rivers and for the purpose of protecting, preserving, promoting, and putting into use the natural resources along said streams and in the area drained by them, there is hereby created the Arkansas, Red, and White Rivers Basin Commission. . . . . All projects within the area above described which have for their purpose the regulating of soil erosion, flood control, irrigation, or for the purpose of furthering navigation, and the production of electric power, shall be projects deemed to be under the jurisdiction of this Commission, and application for the construction and completion of any such projects shall be made to this Commission.

Sec. 2. The Arkansas, Red, and White Rivers Basin Commission shall be composed of three members to be appointed by the President of the United States, from the area within the watersheds of the rivers named. . . . . .

No member of theCommission shall have any financial interest in any public utility or other corporation engaged in the business of distributing or selling power to the public, nor in any business, firm, partnership, or corporation which is engaged in the business of transportation or navigation within the area affected by this Act, or who is either individually or associated with any firm, partnership, or corporation dealing in real estate within the area covered by this Act; nor shall any member have any interest in any business that may be affected by the success of the undertakings of this Commission. Nor shall any member have an interest, direct or indirect, in any business which shall have a financial relation to the business of the Commission. . . .

Sec. 4. Except as otherwise specifically provided in this Act, the function of the Commission shall be --

(a) To study and analyze and thoroughly investigate the feasibility, the cost, the probable scope of, and thepublic benefits to be received from any proposed project within the boundaries of the area which is to be known as the "Arkansas, Red, and White Rivers Basin." The projects, which will come under the supervision of this Commission, except as herein otherwise prescribed, shall be those projects which have to do with the regulation of soil erosion, flood control, and irrigation, and any project or projects the purpose of which is to make the Arkansas, Red, or White Rivers and their tributaries navigable and any project or projects which has/have for its/their purpose the production of electric power within the area drained by the Arkansas, Red, and White Rivers.

1. H. R. 7339, 73d Cong., 2d sess.

(b) To make recommendations to the President of the United States and report to and work in conjunction with any department of the Government which the President may direct in the carrying on of any project.

(c) To purchase or lease and hold in the name of the United States such real and personal property as the Commission deems necessary or convenient in the transaction of its business, and may dispose of any such personal property held by it.

(d) To negotiate and contract with persons, corporations, municipalities, and States in any manner which is necessary to the proper conduct of the business of the Commission.

(e) To supervise and maintain all projects built on its recommendations or which have heretofore been built within the area described by this Act with funds furnished by the Federal Government except as hereinafter provided, and in compliance with the laws of the State in which said project is located, and with the approval of the Chief Executive of the State.

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Sec. 5. The Commission shall have authority, and is hereby authorized, as follows:

(a) Shall have power to acquire real estate for the construction of dams, reservoirs, transmission lines, power houses, and other structures and navigation projects at any point along the Arkansas, Red, and White Rivers, or any of their tributaries. . .

(b) To request the assistance and advice of any officers, agent, or employee of any executive department or of any independent office of the United States to enable the Commission the better to carry out its powers successfully. . . . .

(c) The President shall have authority to direct the cooperation of the United States Army engineers, the Federal Power Commission, and the Reclamation Bureau, and the Department of Agriculture to render such cooperation as may be required.

. . . . . .

(g) Shall have complete supervisory power over any and all completed projects which are under its jurisdiction, except as herein specifically otherwise provided.

Sec. 6. (a) The construction, maintenance, and operation of all projects recommended by or coming under the jurisdiction of the Commission shall be carried on by the United States Army engineers.

(b) The maintenance and operation of all navigation projects shall be under the supervision of the United States Army Engineers.

. . . . . .

Sec. 8. (a) The Commission is hereby authorized to request the Chief of Engineers of the United States Army to furnish it a report on each project submitted to the said Commission for its recommendation, said report to advise the Commission as to what will be the public benefit derived from said project commensurate with the cost of said project to the Federal Government.

(c) Before the Commission shall make recommendation to the President of the United States or to the Congress for an appropriation to construct any project or projects, it shall first obtain from the Chief of Engineers of the United States Army his findings as to the public benefits to be derived from said project commensurate with the cost of said project to the Federal Government.

. . . . . .

Sec. 13. To aid further the proper use, conservation, and development of the natural resources of the Arkansas, Red, and White Rivers Drainage Basin and of such adjoining territory as may be related in or materially affected by the development consequent to this Act, and to provide for the general welfare of the citizens of said areas, the President is hereby authorized, by such means or methods as he may deem proper within the limits of appropriations made therefor by Congress, to make such surveys of any general plans for said Arkansas, Red, and White RiversBasin and adjoinging territory as may be useful to the Congress and to the several States in guiding and controlling the extent, sequence, and nature of development that may be equitably and economically advanced through the expenditure of public funds, or through the guidance or control of public authority, all for the general purpose of fostering an orderly and proper physical, economic, and social development of said areas; and the President is further authorized in making said surveys and plans to cooperate and contract with the States affected thereby, or subdivisions or agencies of such States, or with cooperative or other organizations, and to make such studies, experiments, or demonstrations as may be necessary and suitable to that end.

Sec. 14. The President may, from time to time, as the work provided for in the preceding section progresses, recommend to Congress such legislation as he deems proper to carry out the general purposes stated in said section, and for the especial purpose of bringing about in said Arkansas, Red, and White Rivers drainage basins and adjoining territory in conformity with said general purposes: (1) The maximum amount of flood control; (2) the maximum development of said Arkansas, Red, and White Rivers fornavigation purposes; (3) the maximum generation of electric power consistent with flood control and navigation; (4) the proper use of marginal lands; (5) the proper method of reforestation of all lands in said drainage basin suitable for reforestation; and (6) the economic and social well-being of the people living in said rivers basin.

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Sec. 17. All appropriations necessary to carry out the provisions of this Act are hereby authorized. . . . .

Sec. 18. For the purpose of construction and maintenance of such projects of flood control, irrigation, navigation, soil erosion, and production of electric power, there is hereby appropriated, out of any money in the Treasury of the United States not otherwise appropriated, the sum of $75,000,000, or so much thereof as may be necessary, to complete projects adopted by the Commission, the Board of United States Army Engineers, and approved by the Chief Executive of the States in which the projects are located.

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APPENDIX H.

The Missouri Valley Authority Bill[1]

A bill to provide for the control of flood waters of the Missouri Valley; to improve navigation of the Missouri River; to provide for irrigation of arid and semiarid lands, divert the flood waters of the Missouri River to receding or receded natural lake beds; to provide for the restoration and preservation of the water level of the Missouri Valley; to protect the fertility of the soil of the Missouri Valley; to provide for the generation, distribution, and sale of electricity; and for other purposes.

Be it enacted. . . . . , That the objects of this Act are (1) to provide for the control of the flood waters of the Missouri Valley; (2) to divert said flood waters for irrigation purposes and for the purpose of supplying water for receding or receded natural lake beds in adjacent and accessible areas; (3) to improve the navigation of the Missouri River; (4) to provide for the restoration and preservation of the water level in the Missouri Valley; (5) to protect the fertility of the soil of the Missouri Valley; and (6) so far as consistent with the purposes of this Act, and in order to lessen the expense of flood, control, navigation, diversion, and irrigation, to provide for the generation, transmission, distribution, and sale of electricity.

Sec. 2. The Missouri Valley means all that section of the United States the waters of which, if undiverted, ultimately flow into the Missouri River. In order to carry out the purposes of this Act, there is hereby created a body corporate by the name of the Missouri Valley Authority. . . . .

Sec. 3. The board of directors of the Corporation shall be composed of three members to be appointed by the President, by and with the advice and consent of theSenate. In appointing the members of the board, the President shall designate the chairman. All other officials and employees shall be designated and selected by the board. . . . . Each of the members of the board shall be a citizen of the United States and shall receive a salary of $10,000 a year, to be paid by the Corporation as current expenses. . . . . No member of the board shall have any financial interest in any public utility corporation engaged in the business of generating, transmitting, distributing, or selling electric power to the public. The board shall direct the exercise of all the powers of the Corporation. All members of the board shall be persons who profess a belief in the feasibility and wisdom of this Act.

. . . . . .

Sec. 5. Except as otherwise specifically provided in this Act, the Corporation --

(a) Shall have succession in its corporate name.

(b) May sue and be sued in its corporate name.

(c) May adopt and use a corporate seal, which shall be judicially noticed.

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1. H. R. 11958, 74th Cong., 2d sess.

(d) May make contracts as herein authorized.
(e) May adopt, amend, and repeal bylaws.
(f) May purchase or lease and hold such real and personal property as it deems necessary or convenient in the transaction of its business, and may dispose of any such personal property held by it. . . . . .
(g) Shall have such powers as may be necessary or appropriate for the exercise of the powers herein specifically conferred upon the Commission.
(h) Shall have power in the name of the United States of America to exercise the right of eminent domain. . . . .
(i) Shall have power to acquire any real estate for the construction of dams, reservoirs, transmission lines, power houses, and other structures, and navigation projects at any point along the Missouri River, or any ofits tributaries. . . . .
(j) Shall have power to construct dams, diversion ditches, reservoirs, power houses, power structures, transmission lines, navigation projects, and incidental works in the Missouri River and its tributaries, and to unite the various power installations into one or more systems by transmission lines.

Sec. 6. The board is hereby authorized --
(a) To establish, maintain, and operate laboratories and experimental plants.
(b) To request the assistance and advice of any officer, agent, or employee of any executive department or of any independent office of the United States. . . . .
(c) To generate, transmit, distribute, and sell electric power as herein specified.
. . . . . .
Sec. 10. The Corporation is hereby authorized and directed to construct under the terms of this Act any dam or dams which by its study and survey of the Missouri River Valley is by said Corporation deemed necessary or feasible; and it is hereby directed to construct such dam or dams as may be necessary to assist in the control of the flood waters of the Missouri River or any of its tributaries wherever nature has provided a natural storage reservoir which can be utilized for the storage of such flood waters. For the purpose of this Act a tributary is defined to be any stream the waters of which, in their natural course, become a part of the waters of the Missouri River. The Corporation is authorized to utilize such stored waters for the purpose of irrigation, diversion, flood control, navigation, and the development of electric power.
The Corporation is further authorized to construct ditches and do any other thing necessary to be done in diverting the flood waters of the Missouri River to supply water to receding or receded natural lake beds in any area adjacent and accessible to the project or projects which may be established under authority of this Act.
It shall be the duty of the Corporation by the methods and means provided for in this Act to bring about in said Missouri River Valley, including its tributaries, (1) the maximum amount of flood control; (2) the maximum benefit to navigation; (3) the maximum amount of irrigation; (4) the maximum generation of electric power consistent with irrigation, flood control, and navigation; (5) the proper use of marginal lands; (6) the proper method of reforestation

of lands in said valley suitable for reforestation; and (7) the economic and social well-being of the people living in said valley. It is not intended that the board shall supply wate r for irrigation to individual farmers, but that it shall sell water for irrigation to irrigation corporations, and, preferably, to cooperative organizations of farmers organized under State laws, for the purpose of irrigating lands owned by the members of such organizations.

The President is hereby authorized, by such means and methods as he may deem proper within the limits of appropriations made therefor, to make such surveys and general plans for said territory as may be useful to Congress, to the Corporation, and to the several States, in guiding and controlling the extent, sequence, and nature of the development that may be equitably and commercially advanced through the expenditure of public funds, and through the guidance and control of public authority, all for the general purpose of fostering an orderly and proper physical, social, and economic development of said area. The President and the Corporation are further authorized, in making such plans and surveys, to cooperate with the States affected thereby, or with subdivisions or agencies of such States, or with cooperative or other organizations, and to make such studies, experiments, or demonstrations as may be necessary or suitable to that end. He or it shall recommend to Congress from time to time, as the work provided for in this Act proceeds, such legislation as may be deemed proper to carry out the general purposes of this Act.

. . . . . .

Sec. 12. Upon its completion, the dam now being constructed by the War Department on the Missouri River, at Fort Peck, Montana, shall be turned over to the Corporation, and thereafter said dam and all the works, transmission lines, and other property connected therewith shall be under the controlof the Corporation, the same as all other projects herein provided for.

The corporation shall make a thorough investigation as to the cost of said dam, and as to the cost of any dam provided for in this Act, for the purpose of ascertaining what part of the cost of said dams and other improvements shall be allocated and charged to (1) flood control, (2) navigation, (3) irrigation, (4) diversion, and (5) power development. The findings thus made by the Corporation, when approved by the President of the United States, shall be final, and such findings shall thereafter be used in keeping the book value of said properties.

In fixing the amount which farmers or organizations of farmers, or others, shall pay for water stored by the Corporation to be used by such organizations for irrigation, no greater charge shall be made for said water than will be sufficient to reimburse the Government for the cost allocated to irrigation. In fixing the amount thus allocated to power, no purchaser of electric current shall bd charged a greater amount than will be sufficient to reimburse the Government for the cost allocated to power. It is hereby declared to be the intention of this Act that the users of water for irrigation shall not be required to pay any part of theprojects herein not allocated to irrigation, and that the users of electricity shall not be required to pay any part of said projects not allocated to power, but that the charges for water to be used for irrigation

and the charges for power shall be based, respectively, upon the allocations to irrigation and power; that when the Government has been paid in either case, the entire amount expended for irrigation or for power, the charges thereafter assessed against irrigation or power shall be just sufficient to pay its part of the maintenance, upkeep, and management of said projects thus allocated either to irrigation or power.

Sec. 13. The board is hereby directed in the operation of any dam or reservoir in its possession and control to regulate the stream flow primarily for the purpose of promoting navigation and controlling floods. So far as may be consistent with such purposes, the board is authorized to provide and operate facilities for the generation of electric energy at any such dam for the use of the Corporation and for the use of the United States or any agency thereof, and the board is further authorized, whenever an opportunity is afforded, to provide and operate facilities for the generation of electric energy in order to avoid the waste of water power, to transmit and market such power as in this Act provided, and thereby, so far as may be practicable, to assist in liquidating the cost of flood control, navigation, and irrigation.

Sec. 14. The board is hereby empowered and authorized to sell the surplus power not used in its operations . . . . . to States, counties, municipalities, corporations, partnerships, or individuals, accordingly to the policies hereinafter set forth; and to carry out said authority, the board is authorized to enter into contracts for such sale for a term not exceeding twenty years, and in the sale of such current by the board it shall give preference to States, counties, municipalities, and cooperative organizations of citizens or farmers, not organized or doing business for profit, but primarily for the purpose of supplying electricity to its own citizens or members: Provided, That all contracts made with private companies or individuals for the sale of power, which power is to be resold for a profit, shall contain a provision authorizing the board to cancel said contract upon one year's notice in writing, if the board needs said power to supply the demands of States, counties, municipalities, or said organizations. In order to promote and encourage the fullest possible use of electric light and power on farms within reasonable distance of any of its transmission lines the board, in its discretion, shall have power to construct transmission lines to farms and small villages that are not otherwise supplied with electricity at reasonable rates, and to make such rules and regulations governing such sale and distribution of such electric power as in its judgment may be just and equitable: Provided further, That the board is hereby authorized and directed to make studies, experiments, and determinations to promote the wider and better use of electric power for agricultural and domestic use, or for small or local industries, and it may cooperate with State governments, or their subdivisions or agencies, with educational or research institutions, and with cooperatives or other organizations, in the application of electric power to the fuller and better balanced development of the resources of the region.

Sec. 15. In order to place the board upon a fair basis for making such contracts and for receiving bids for the sale of such power, it is hereby expressly authorized, either from appropriations made by Congress or from funds secured from the sale of such power, to construct, lease, purchase, or authorize the construction of transmission lines within transmission distance from the place where generated, and to interconnect with other systems. The board is also authorized to lease to any person, persons, or corporation the use of any transmission line owned by the Government and operated by the board, but no such lease shall be made that in any way interferes with the use of such transmission line by the board: Provided, That if any State, county, municipality, or other public or cooperative organization of citizens or farmers, not organized or doing business for profit but primarily for the purpose of supplying electricity to its own citizens or members, or any two or more of such municipalities or organizations, shall construct or agree to construct and maintain a properly designed and built transmission line to the Government reservation upon which is located a Government generating plant, or to a main transmission line owned by the Government or leased by the board and under the control of the board, the board is hereby authorized and directed to contract with such State, county, municipality, or other organization, or two or more of them, for the sale of electricity for a term not exceeding thirty years; and in any such case the board shall give to such State, county, municipality, or other organization ample time to fully comply with any local law now in existence or hereafter enacted providing for the necessary legal authority for such State, county, municipality, or other organization to contract with the board for such power: Provided further, That all contracts entered into between the Corporation and any municipality or other political subdivision or cooperative organization shall provide that the electric power shall be sold and distributed to the ultimate consumer without discrimination as between consumers of the same class, and such contract shall be voidable at the election of the board if a discriminatory rate, rebate, or other special concession is made or given to any consumer or user by the municipality or other political subdivision or cooperative organization: And provided further, That the board is hereby authorized to enter into contracts with other power systems for the mutual exchange of unused excess power upon suitable terms, for the conservation of stored water, and as an emergency or break-down relief.

Sec. 16. In order to convert secondary power into primary power and thus assist to a greater extent in the payment of the expenses of flood control, diversion, and navigation, the Corporation is hereby authorized to construct or operate any plant or plants, either steam or otherwise, to be used as stand-by plants in connection with hydroelectric generating plants herein provided for.

. . . . . .

Sec. 20. All appropriations necessary to carry out the provisions of this Act are hereby authorized.

APPENDIX I.

The Mississippi Valley Authority Bill[1]

A bill to provide for the control of flood waters in the Mississippi Valley, to improve navigation on the Mississippi River and its tributaries, to provide for the irrigation of arid and semi-arid lands, and for other purposes.

Be it enacted . . . . , That with the exception hereinafter referred to in section 20, the objects of this Act are (1) to provide for the control of the flood waters of the Mississippi Valley; (2) to improve navigation on the Mississippi River and its tributaries; (3) to provide for the irrigation of arid and semiarid lands; (4) to provide for the restoration and preservation of the water level in the Mississippi Valley; (5) to protect the fertility of the soil of the Mississippi Valley; and (6) so far as is consistent with and in order to lessen the expense of flood control, navigation, and irrigation, to provide for the generation, transmission, distribution, and sale of electricity.

Sec. 2. The Mississippi Valley means all that section of the United States the waters of which, if undiverted, ultimately flow into the Mississippi River. In order to carry out the purposes of this Act, there is hereby created a body corporate by the name of the Mississippi Valley Authority. Said Corporation shall be controlled by a board of directors. . . . .

Sec. 3. The board of directors of theCorporation shall be composed of three members to be appointed by the President, by and with the advice and consent of the Senate. . . . . Each of the members of the board shall be a citizen of the United States and shall receive a salary at the rate of $10,000 a year, to be paid by the Corporation as current expenses. . . . . No member of said board shall, during his continuance in office, be engaged in any other business, but each member shall devote himself to the work of the Corporation. No member of the board shall have any financial interest in any public-utility corporation engaged in the business of generating, transmitting, distributing, or selling electric power to the public. The board shall direct the exercise of all the powers of the Corporation. All members of the board shall be persons who profess a belief in the feasibility and wisdom of this Act.

. . . . . .

Sec. 5. Except as otherwise specifically provided in this Act, the Corporation --

(a) Shall have succession in its corporate name.

(b) May sue and be sued in its corporate name.

(c) May adopt and use a corporate seal, which shall be judicially noticed.

(d) May make contracts as herein authorized.

(e) May adopt, amend, and repeal bylaws.

(f) May purchase or lease and hold any such real and personal property as it deems necessary or convenient in the transaction of

1. S. 3524, 74th Cong., 2d sess.

its business, and may dispose of any such personal property held by it. . . . .

(g) Shall have powers as may be necessary or appropriate for the exercise of the powers herein specifically conferred upon the Corporation.

(h) Shall have power in the name of the United States of America to exercise the right of eminent domain, and . . . .

(i) Shall have power to acquire real estate for the construction of dams, reservoirs, transmission lines, power houses, and other structures, and navigation projects at any point along the Mississippi River, or any ofits tributaries. . . . .

(j) Shall have power to construct dams, reservoirs, power houses, power structures, transmission lines, navigation projects, and incidental works in the Mississippi River and its tributaries, and to unite the various power installations into one or more systems by transmission lines.

Sec. 6. The board is hereby authorized --

(a) To establish, maintain, and operate laboratories and experimental plants.

(b) To request the assistance and advice of any officer, agent, or employee of any executive department or of any independent office of the United States, to enable the Corporation the better to carry out its powers successfully. . . . .

(c) To generate, transmit, distribute and sell electric power as herein specified.

Sec. 7. In the appointment of officials and the selection of employees for said Corporation, and in the promotion of any such employees or officials, no political test or qualification shall be permitted or given consideration, and all such appointments and promotions shall be given and made on the basis of merit and efficiency. . . . .

. . . . . .

Sec. 10. The Corporation is hereby authorized and directed to construct under the terms of this Act any dam or dams which by its study and survey of the Mississippi River Valley is by said Corporation deemed necessary or feasible; and it is hereby directed to construct such dam or dams as may be necessary to assist in the control of the flood waters of the Mississippi River or any of its tributaries wherever nature has provided a natural storage reservoir which can be utilized for the storage of such flood waters. For the purpose of this Act a tributary is defined to be any stream the waters of which, in their natural course, become a part of the waters of the Mississippi River. The Corporation is authorized to utilize such stored waters for the purpose of irrigation, flood control, navigation, and the development of electric power.

It shall be the duty of the Corporation by the methods and means provided for in this Act to bring about in said Mississippi River Valley, including its tributaries, (1) the maximum amount of flood control; (2) the maximum benefit to navigation; (3) the maximum amount of irrigation; (4) the maximum generation of electric power consistent with irrigation, flood control, and navigation; (5) the proper use of marginal lands; (6) the proper method of reforestation of lands in said valley suitable for reforestation; and

(7) the economic and social well-being of the people living in said valley. It is not intended that the board shall supply water for irrigation to individual farmers, but that it shall sell water for irrigation to irrigation corporations, and, preferably, to cooperative organizations of farmers organized under State laws, for the purpose of irrigating lands owned by the members of such organizations.

The President is hereby authorized, by such means and methods as he may deem proper within the limits of appropriations made therefor, to make such surveys and general plans for said territory as may be useful to Congress, to the Corporation, and to the several States, in guiding and controlling the extent, sequence, and nature of the development that may be equitably and commercially advanced through the expenditure of public funds, and through the guidance and control of public authority, all for the general purpose of fostering an orderly and proper physical, social, and economic development ofsaid area. The President and the Corporation are further authorized, in making such plans and surveys, to cooperate with the States affected thereby, or with subdivisions or agencies of such States, or with cooperative or other organizations, and to make such studies, experiments, or demonstrations as may be necessary or suitable to that end. He or it shall recommend to Congress from time to time, as the work provided for in this Act proceeds, such legislation as may be deemed proper to carry out the general purposes of this Act.

. . . . . .

Sec. 12. Upon its completion, the dam now being constructed by the War Department on the Missouri River, at Fort Peck, Montana, shall be turned over to the Corporation, and thereafter said dam and all the works, transmission lines, and other property connected therewith shall be under the control of the Corporation, the same as all other projects herein provided for.

The Corporation shall make a thorough investigation as to the cost of said dam, and as to the cost of any dam provided for in this Act, for the purpose of ascertaining what part of the cost of said dams and other improvements shall be allocated and charged to (1) flood control, (2) navigation, (3) irrigation, and (4) power development. The findings thus made by the Corporation, when approved by the President of the United States, shall be final, and such findings shall thereafter be used in keeping the book value of said properties.

In fixing the amount which farmers or organizations of farmers, or others, shall pay for water stored by the Corporation to be used by such organizations for irrigation, no greater charge shall be made for said water than will be sufficient to reimburse the Government for the cost allocated to irrigation. In fixing the amount thus allocated to power, no purchaser of electric current shall be charged a greater amount than will be sufficient to reimburse the Government for the cost allocated to power. It is hereby declared to be the intention of this Act that the users of water for irrigation shall not be required to pay any part of the projects herein not allocated to irrigation, and that the users of electricity shall not be required to pay any part of said projects not allocated to power, but that the charges for water to be used for irrigation and the charges for power shall be based, respectively, upon the allocations to irrigation and power; that when the Government has been

paid in either case, the entire amount expended for irrigation or for power, the charges thereafter assessed against irrigation or power shall only be sufficient to pay its part of the maintenance, upkeep, and management of said projects thus allocated either to irrigation or power.

Sec. 13. The board is hereby directed in the operation of any dam or reservoir in its possession and control to regulate the stream flow primarily for the purposes of promoting navigation and controlling floods. So far as may be consistent with such purposes, the board is authorized to provide and operate facilities for the generation of electric energy at any such dam for the use of the Corporation and for the use of the United States or any agency thereof, and the board is further authorized, whenever an opportunity is afforded, to provide and operate facilities for the generation of electric energy in order to avoid the waste of water power, to transmit and market such power as in this Act provided, and thereby, so far as may be practicable, to assist in liquidating the cost of flood control, navigation, and irrigation.

Sec. 14. The board is hereby empowered and authorized to sell the surplus power not used in its operations, and for operation of locks and other works generated by it, to States, counties, municipalities, corporations, partnerships, or individuals, according to the policies hereinafter set forth; and to carry out said authority, the board is authorized to enter into contracts for such sale for a term not exceeding twenty years, and in the sale of such current by the board it shall give preference to States, counties, municipalities, and cooperative organizations of citizens or farmers, not organized or doing business for profit, but primarily for the purpose of supplying electricity to its own citizens or members: Provided, That all contracts made with private companies or individuals for the sale of power, which power is to be resold for a profit, shall contain a provision authorizing the board to cancel said contract upon one year's notice in writing, if the board needs said power to supply the demands of States, counties, municipalities, or said organizations. In order to promote and encourage the fullest possible use of electric light and power on farms within reasonable distance of any of its transmission lines the board, in its discretion, shall have power to construct transmission lines to farms and small villages that are not otherwise supplied with electricity at reasonable rates, and to make such rules and regulations governing such sale and distribution of such electric power as in its judgment may be just and equitable; Provided further, That the board is hereby authorized and directed to make studies, experiments, and determinations to promote the wider and better use of electric power for agricultural and domestic use, or for small or local industries, and it may cooperate with State governments, or their subdivisions or agencies, with educational or research institutions, and with cooperatives or other organizations, in the application of electric power to the fuller and better balanced development of the resources of the region.

Sec. 15. In order to place the board upon a fair basis for making such contracts and for receiving bids for the sale of such power, it is hereby expressly authorized, either from appropriations made by

Congress or from funds secured from the sale of such power, to construct, lease, purchase, or authorize the construction of transmission lines within transmission distance from the place where generated, and to interconnect with other systems. The board is also authorized to lease to any person, persons, or corporation the use of any transmission line owned by the Government and operated by the board, but no such lease shall be made that in any way interferes with the use of such transmission line by the board: Provided, That if any State, county, municipality, or other public or cooperative organization of citizens or farmers, not organized or doing business for profit but primarily for the purpose of supplying electricity to its own citizens or members, or any two or more of such municipalities or organizations, shall construct or agree to construct and maintain a properly designed and built transmission line to the Government reservation upon which is located a Government generating plant, or to a main transmission line owned by the Government or leased by the board and under the control of the board, the board is hereby authorized and directed to contract with such State, county, municipality, or other organization, or two or more of them, for the sale of electricity for a term not exceeding thirty years; and in any such case the board shall give to such State, county, municipality, or other organization ample time to fully comply with any local law now in existence or hereafter enacted providing for the necessary legal authority for such State, county, municipality, or other organization to contract with the board for such power: Provided further, That all contracts entered into between the Corporation and any municipality or other political subdivision or cooperative organization shall provide that the electric power shall be sold and distributed to the ultimate consumer without discrimination as between consumers of the same class, and such contract shall be avlidable at the election of the board if a discriminatory rate, rebate, or other special concession is made or given to any consumer or user by the municipality or other political subdivision or cooperative organization: And provided further, That the board is hereby authorized to enter into contracts with other power systems for the mutual exchange of unused excess power upon suitable terms, for the conservation of stored water, and as an emergency or break-down relief.

Sec. 16. In order to convert secondary power into primary power and thus assist to a greater extent in the payment of the expenses of flood control and navigation, the Corporation is hereby authorized to construct or operate any plant or plants, either steam or otherwise, to be used as stand-by plants in connection with hydroelectric generating plants herein provided for.

. . . . . .

Sec. 20. The Ohio River and its tributaries and the Ohio River Valley are hereby exempted from the provision of this Act.

Sec. 21. The Ohio River and its tributaries and the Ohio River Valley shall hereafter be under the control and supervision ofthe Tennessee Valley Authority, and said river and its tributaries and said valley shall hereafter be included under and governed by the Tennessee Valley Authority Act of 1933 and Acts amendatory thereto.

Sec. 22. All appropriations necessary to carry out the provisions of this Act are hereby authorized.

APPENDIX J.

The Potomac Valley Authority Bill[1]

A bill for the development and improvement of navigation and of electric power on the Potomac River and its tributaries, and control of floods and soil erosion.

Be it enacted . . . . , That there is hereby created a corporation, entitled "Potomac Valley Authority", whose purpose it shall be to develop and administer public works in the watershed of the Potomac River and its tributaries as hereinafter provided.

Sec. 2. The said Authority shall be controlled by three administrators, appointed by the President of the United States, with the consent of the Senate, subject to the condition that no such administrator shall be lawfully appointed or hold office if during three years prior to his appointment the said administrator held any pecuniary interest, directly or indirectly, in any power company or directly or indirectly controlled any such company operating in the territory under the supervision of the Authority. . . . . Compensation for the said administrators shall be $10,000 per annum.

Sec. 3. Immediately after the organization of the said Authority, in accordance with the provisions of this Act, it shall proceed to make a survey of the Potomac River Valley and shall determine the location of dams, power stations, and appurtenant structures in the said territory and shall report to Congress the plans for navigation, flood control, and soil-erosion control upon said Potomac River and its tributary streams and appurtenant landings and for other facilities in connection therewith, and for the construction of bridges and through highways across the said river both in connection with the said dams and as separate structures, and the said Authority shall further study and report the approximate cost and the probable date of completion of each or any of the said improvements in a preliminary report to be rendered to Congress on or before the 15th of January, 1939.

Sec. 4. The said Authority is hereby authorized to proceed with the acquisition of lands, easements, rights-of-way, or other interest in lands which would be affected by the construction of any of the improvements contemplated by the provisions of this legislation of which would further the purposes of the said Act for such compensation as the said Authority may deem reasonable, subject to the approval of the President of the United States.

Sec. 5. The said Authority may proceed prior to the submission of its preliminary report with the design, construction, acquisition, and operation of any structure or appurtenant facility which it finds to be essential to the purposes of this Act.

Sec. 6. The said Authority may sell, lease, or otherwise dispose of any surplus water power or power-producing facilities acquired or

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1. H. R. 3488, 75th Cong., 1st sess.

constructed in furtherance of its duties, and may own, operate, and maintain any hydroelectric plant, together with appurtenant pumping stations, mains, stand-by steam, or other electrical equipment, transmission, and distribution lines for the supply of the United States Government within the District of Columbia and of any community or political subdivision adjacent to the said Potomac River or its tributaries.

Sec. 7. Any contract for the sale or other disposition of water power or power-producing facilities shall be subject prior to execution to the approval of the Federal Power Commission upon application made by the said Authority to the said Commission.

Sec. 8. Except as otherwise specifically provided in this section, the Authority --

(a) Shall have succession in its corporate name.

(b) May sue and be sued in its corporate name.

(c) May adopt and use a corporate seal, which shall be judicially noticed.

(d) May make contracts, as herein authorized.

(e) May adopt, amend, or repeal bylaws.

(f) May purchase or lease and hold such real and personal property as it deems necessary or convenient in the transaction of its business, and may dispose of any such personal property held by it. . . . .

(g) Shall have such powers as may be necessary or appropriate for the exercise of the powers herein specifically conferred upon the Authority.

(h) Shall have power in the name of the United States of America to exercise the right of eminent domain. . . . .

(i) Shall have power to acquire real estate for the construction of dams, reservoirs, transmission lines, power-houses, and other structures, and navigation projects at any point along the Potomac River, or any of its tributaries. . . . .

Sec. 9. In the appointment of officials and the selection of employees for the said Authority, and in the promotion of any such employees or officials, no political test or qualification shall be permitted or given consideration. . . . .

. . . . . .

Sec. 12. The Authority is hereby empowered and authorized to sell the surplus power not used in its operations, and for operation of locks and other works generated by it, to States, counties, municipalities, corporations, partnerships, or individuals, according to the policies hereinafter set forth; and to carry out said authority the Authority is authorized to enter into contracts for such sale for a term not exceeding twenty years, and in the sale of such current by the Authority it shall give preference to States, counties, municipalities, and cooperative organizations of citizens or farmers, not organized or doing business for profit, but primarily for the purpose of supplying electricity to its own citizens or members: Provided, That all contracts made with private companies or individuals for the sale of power, which power is to be resold for a profit, shall contain a provision authorizing the Authority to cancel said contract upon five years' notice in writing,

if the Authority needs said power to supply the demands of States, counties, or municipalities. In order to promote and encourage the fullest possible use of electric light and power on farms within reasonable distance of any ofits transmission lines, the Authority in its discretion shall have power to construct transmission lines to farms and small villages that are not otherwise supplied with electricity at reasonable rates, and to make such rules and regulations governing such sale and distribution of such electric power as in its judgment may be just and equitable: Provided further, That the Authority is hereby authorized and directed to make studies, experiments, and determinations to promote the wider and better use of electric power for agricultural and domestic use, or for small or local industries, and it may cooperate with State governments, or their subdivisions or agencies, with educational or research institutions, and with cooperatives or other organizations, in the application of electric power to the fuller and better balanced development of the resources of the region.

Sec. 13. It is hereby declared to be the policy of the Government so far as practical to distribute and sell the surplus power generated by the Authority equitably among the States, counties, and municipalities within transmission distance. This policy is further declared to be that projects herein provided for shall be considered primarily as for the benefit of the people of the section as a whole and particularly the domestic and rural consumers to whom the power can economically be made available, and accordingly, that sale to and use by industry shall be a secondary purpose, to be utilized principally to secure a sufficiently high-load factor and revenue returns which will permit domestic and rural use of electricity.

Sec. 14. It shall be the duty of the said Authority to design, construct, and administer all navigation, power, soil-erosion, and flood-control projects so as to conserve and stabilize the flow of the Potomac River and its tributaries and to prevent damage due to floods. The Authority may acquire lands and rights in lands for the conservation of watersheds and the prevention of erosion and may improve the said lands for this purpose.

Sec. 15. As soon as a stable supply of electric energy is available from the producing facilities of the Authority it shall construct and acquire transmission lines and equipment to connect with the facilities of the United States Government within the District of Columbia and shall thereafter supply electric energy upon demand to the said facilities at prices to be fixed by the Authority. The service of the said operations shall take precedence over any other authorized service by the Authority.

Sec. 16. In connection with the preliminary report required by section 3 of this Act, the said Authority shall submit to Congress a comprehensive study of the potential loss in tax revenue to the States of Maryland and Virginia, together with a recommendation as to a plan for the adequate compensation of the said States comparable with the taxes which would be paid by private utility enterprise whose facilities were limited to the production and supply of electric current.

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APPENDIX K.

The Connecticut Valley Authority Bill[1]

A bill for the development and improvement of navigation and of electric power on the Connecticut River and its tributaries, and control of floods, prevention of soil erosion, elimination of pollution, reforestation and creation of recreational areas; for the coordination and cooperation of Federal, State, and local agencies, and the creation of a Federal authority, and an advisory commission selected by the Governors of the New England States.

Be it enacted . . . . , That for the purpose of developing, maintaining, and administering public works in the watershed of the Connecticut River and its tributaries as hereinafter provided there is hereby created a body corporate by the name of the "Connecticut Valley Authority".

And for the purpose of improved coordination between Federal, State, and local agencies and cooperation in any interstate compacts between any of the States of Maine, New Hampshire, Vermont, Massachusetts, and Connecticut, there is hereby created an advisory body, composed of persons selected by the Governors of these States, and to be known as the "Connecticut Valley Advisory Commission".

Sec. 2. (a) Said Corporation shall be controlled by a board of directors. . . . .

(b) The advisory commission shall consist of ten members, and not more than three shall be residents of any one State. They shall be appointed by the President with the advice and consent of the Governors of their respective States of residence. Only residents of the States of Maine, New Hampshire, Vermont, Connecticut, or Massachusetts shall be eligible for membership on this commission.

Said advisory commission shall meet from time to time for the purpose of making studies, surveys, and recommendations as to any matters within the provisions of this Act; but they shall not meet less than once in every three successive months. . . . .

Said commission shall advise with their respective Governors or other State officials from time to time, and may consult with the Board of Engineers, War Department, and other Federal agencies.

The commission shall submit its opinions and recommendations in writing to the board.

Each commissioner shall receive $40 per diem from the United States Treasury for attendance at meetings or for the performance of any other duties requested by the President or the board; but no commissioner shall receive more than $2,000 per year from the United States Treasury. . . . .

The commission shall from time to time inform the board of any matters or problems of interest to the various States, and political subdivisions.

The commission shall at all times endeavor to promote the welfare of the region and its people. It shall try to arrange for cooperation and coordination between Federal, State, and local interests and shall submit helpful recommendations and information.

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1. H. R. 4811, 75th Cong., 1st sess.

Whenever interstate compacts regarding public works are arranged between any two or more States, said commission shall make recommendations to the board for the better cooperation between the States and the board. . . . .

Sec. 3. The board of directors of the Corporation shall be composed of three members to be appointed by the President, by and with the advice and consent of the Senate. . . . . Each of the members of the board shall be a citizen of the United States and shall receive a salary at the rate of $7,500 per year, to be paid by the Corporation as current expenses. . . . . No member of said board, shall, during his continuance in office, be engaged in any other business, but each member shall devote himself to the work of the Corporation. No member of the board shall have any financial interest in any public-utility corporation engaged in the business of generating, transmitting, distributing, or selling electric power to the public. The board shall exercise all the powers of the Corporation.

. . . . . .

Sec. 5. Except as otherwise specifically provided in this Act, the Corporation --

(a) Shall have succession in its corporate name.

(b) May sue and be sued in its corporate name.

(c) May adopt and use a corporate seal, which shall be judicially noticed.

(d) May adopt, amend, and repeal bylaws.

(e) May make contracts as herein authorized.

(f) May purchase or lease and hold such real and personal property as it deems necessary or convenient in the transaction of its business, and may dispose of any such personal property held by it. . . . .

(g) Shall have such powers as may be necessary or appropriate for the exercise of the powers herein specifically conferred upon the Corporation.

(h) Shall have power in the name of the United States of America to exercise the right of eminent domain. . . . .

(i) Shall have power to acquire real estate for the construction of dams, reservoirs, dikes, levees, canals, roads, transmission lines, power-houses and other structures, and navigation, flood-control, and hydroelectric projects, and for reforestation, prevention of soil erosion, elimination of pollution, recreational areas and public parks at any place in the valley of the Connecticut River or any of its tributaries. . . . .

(j) Shall have power to purchase, rent, lease, or construct, by contract or otherwise, and to maintain and operate dams, reservoirs, roads, bridges, canals, parks and recreational grounds, power houses, power structures, transmission lines, navigation and flood-control projects, and incidental works in the Connecticut River and its tributaries, and to unite the various power installations into one or more systems by transmission lines, and to do any and all things necessary for the carrying out of the purposes of this Act.

(k) Shall have power to contract for the impounding and storage of water and the delivery and sale thereof for manufacture of electrical energy, and for municipal and domestic uses to the States of Maine, New Hampshire, Vermont, Connecticut and Massachusetts and their political subdivisions, and municipal and

private corporations in any of these States.

Sec. 6. The board is hereby authorized --

(a) To establish, maintain, and operate laboratories and experimental plants.

(b) To request the assistance and advice of any officer, agent, or employee of any executive department or of any independent office of the United States, to enable the Corporation the better to carry out its powers successfully. . . . .

(c) To generate, transmit, distribute, and sell electric power as herein specified.

(d) To proceed immediately with the acquisition of lands, easements, rights-of-way, or other interest in lands for constructing reservoirs, dams, dikes, levees, roads, bridges, canals, for prevention of soil erosion, for reforestation or recreational area purposes, and for any purposes which would further the purposes of this Act for such compensation as the said Authority may deem reasonable, subject to the approval of the President of the United States.

(e) To proceed immediately with the design, construction, acquisition, and operation of any structure or appurtenant facility which it finds to be essential to the purposes of this Act, including any such things directly or indirectly necessary for the matters mentioned in paragraph (d) above.

(f) To study the question of and carry out reforestation, prevention of soil erosion, and elimination of pollution; to acquire land for such purposes; and to erect any structures or public projects necessary and incidental thereto.

Sec. 7. In the appointment of officials and the selection of employees for said Corporation, and in the promotion of any such employees or officials, no political test or qualification shall be permitted or given consideration, but all such appointments and promotions shall be given and made on the basis of merit and efficiency.

. . . . . .

Sec. 10. The Corporation is hereby authorized and directed to construct under the terms of this Act any dam or dams which by its study and survey of the Connecticut River Valley is by said Corporation deemed necessary or feasible; and may take the advise and suggestions of the United States Army Engineers in deciding the need or feasibility.

For the purposes of this Act a tributary is defined to be any stream the waters of which, in their natural course, become a part of the waters of the Connecticut River. The Corporation is authorized to utilize such stored waters for the purpose of eliminating pollution, flood control, navigation, and the development of electric power, or for any other purposes set out in this Act.

It shall be the duty of the Corporation by the methods and means provided for in this Act to bring about in said Connecticut River Valley, including its tributaries, (1) the maximum amount of flood control; (2) the maximum benefit to navigation; (3) the maximum elimination of pollution; (4) the maximum generation of electric power consistent with the aforesaid; (5) the proper use of marginal lands; (6) reforestation of lands in said valley, and setting apart of parks and recreational areas; (7) prevention of soil erosion; and (8) the economic and social well-being of the people

living in said valley.

The President is hereby authorized, by such means and methods as he may deem proper within the limits of appropriations made therefor, to make such surveys and general plans for said territory as may be useful to Congress, to the Corporation, and to the several States, in guiding and controlling the extent, sequence, and nature of the development that may be equitably and commercially advanced through the expenditure of public funds, and through the guidance and control of public authority, all for the general purpose of fostering an orderly and proper physical, social, and economic development of said area. The President and Corporation are further authorized, in making such plans and surveys, to cooperate with the States affected thereby, or with subdivisions or agencies of such States, or with cooperative or other organizations; and to utilize as far as possible studies, surveys, and recommendations made by the advisory commission; and to make such studies, experiments, or demonstrations as may be necessary or suitable to that end. The President or said Corporation shall recommend to Congress from time to time, as the work provided for in this Act proceeds, such legislation as may be deemed proper to carry out the general purposes of this Act.

. . . . . .

Sec. 12. The board is hereby directed in the operation of any dam or reservoir in its possession and control to regulate the stream flow primarily for the purposes of promoting navigation and controlling floods. So far as may be consistent with such purposes, the board is authorized to provide and operate facilities for the generation of electric energy at any such dam for the use of the Corporation and for the use of the United States or any agency thereof, and the board is further authorized, whenever an opportunity is afforded, to provide and operate facilities for the generation of electric energy in order to avoid the waste of water power, to transmit and market such power as in this Act provided, and thereby, so far as may be practicable, to assist in liquidating the cost of flood control and navigation.

Sec. 13. The board is hereby empowered and authorized to sell the surplus power not used in its operations, and for operation of locks and other works generated by it, to States, counties, municipalities, corporations, partnerships, or individuals, according to the policies hereinafter set forth; and to carry out said authority the board is authorized to enter into contracts for such sale for a term not exceeding twenty years, and in the sale of such current by the board it shall give preference to States, counties, and municipalities, and cooperative organizations of citizens or farmers not organized or doing business for profit but primarily for the purpose of supplying electricity to its own citizens or members: Provided, That all contracts made with private companies or individuals for the sale of power, which power is to be resold for a profit, shall contain a provision authorizing the board to cancel said contract upon three years' notice in writing if the board needs said power to supply the demands of States, counties, municipalities, or said organizations. In order to promote and encourage the fullest possible use of electric light and power on farms and in factories within reasonable distance of any of its transmission lines the board, in

its discretion, shall have power to construct transmission lines to farms, factories, and small villages that are not otherwise supplied with electricity at reasonable rates, and to make such rules and regulations governing such sale and distribution of such electric power as in its judgment may be just and equitable: Provided further, That the board is hereby authorized and directed to make studies, experiments, and determinations to promote the wider and better use of electric power for agricultural and domestic use, or for small or local industries, and it may cooperate with State governments, or their subdivisions or agencies, with educational or research institutions, and with cooperatives or commercial and manufacturing or other organizations, in the application of electric power to the fuller and better balanced development of the resources of the region.

Sec. 14. In order to place the board upon a fair basis for making such contracts and for receiving bids for the sale of such power, it is hereby expressly authorized, either from appropriations made by Congress or from funds secured from the sale of such power, to construct, lease, purchase, or authorize the construction of transmission lines within transmission distance from the place where generated, and to interconnect with other systems. The board is also authorized to lease to any person, persons, or corporation the use of any transmission line owned by the Government and operated by the board, but no such lease shall be made that in any way interferes with the use of such transmission line by the board: Provided, That if any State, county, municipality, or other public or cooperative organization of citizens or farmers, not organized or doing business for profit but primarily for the purpose of supplying electricity to its own citizens or members, or any two or more of such municipalities or organizations, shall construct or agree to cons truct and maintain a properly designed and built transmission line to the Government reservation upon which is located a Government generating plant, or to a main transmission line owned by the Government or leased by the board and under the control of the board, the board is hereby authorized and directed to contract with such State, county, municipality, or other organization, or two or more of them, for the sale of electricity for a term not exceeding thirty years; and in any such case the board shall give to such State, county, municipality, or other organization ample time to fully comply with any local law now in existence or hereafter enacted providing for the necessary legal authority for such State, county, municipality, or other organization to contract with the board for such power: Provided further, That all contracts entered into between the Corporation and any municipality or other political subdivision or cooperative organization shall provide that the electric power shall be sold and distributed to the ultimate consumer without discrimination as between consumers of the same class, and such contract shall be voidable at the election of the board if a discriminatory rate, rebate, or other special concession is made or given to any consumer or user by the municipality or other political subdivision or cooperative organization: And provided further, That the board is hereby authorized to enter into contracts with other power systems for the mutual exchange of unused excess power upon suitable terms, for the conservation of stored water, and as an emergency or breakdown relief.

Sec. 15. In order to convert secondary power into primary power and thus assist to a greater extent in the payment of the expenses of flood control and navigation, the Corporation is hereby authorized to construct or operate any plant or plants, either steam or otherwise, to be used as stand-by plants in connection with hydroelectric generating plants herein provided for.

. . . . . .

Sec. 20. (a) Ten per centum of the gross proceeds received by the board from the sale of electricity, water power, or water in any one of the aforesaid States shall be paid to such State wherein received. . . . .

Sec. 21. The term "domestic use" when used in this Act shall include the use of water for household, stock, mining, milling, industrial, commercial, and like purposes.

Sec. 22. There is hereby authorized to be appropriated such sums, not to exceed $50,000,000 inthe aggregate, as may be necessary to carry out the provisions of this Act.

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